CANADA

NATURAL RESOURCES CANADA, VOL. 6, NOS. 1 to 6.

Department of the Interior, Ottawa.

Jan. to June, 1927.

NATURAL RESOURCES CANADA

Published by DEPARTMENT OF THE INTERIOR, Ottawa

VOL. 6 JANUARY, 1927 No. 1

CANADIAN SEED AGAIN AWARDED HIGHEST HONORS

LAURELS GO TO PEACE RIVER COUNTRY

Dominion's Representatives at International Exposition Score With Both Grains and Live Stock

Canada, as in past years, again took a high stand in the competitions at the International Live Stock Exposition and Hay and Grain Show at Chicago in December. The winnings embraced live stock as well as grains but it was the successes in the latter class which particularly directed the attention of the outside world to Canada. The outstanding event was the winning by a young settler in the Peace River country, of the world's wheat and oats championships. This is the first occasion in the history of this exposition on which these two championships were won by one man.

There are several significant points about this success. One is that the grain was grown in the Peace River district, the most recently opened up of Canada's farming areas, lying to the west and north of the arable lands which now produce the bulk of the crop of the Prairie Provinces. Thirty years ago—and less—the statement that wheat could be grown in Peace River district would have sounded as fantastic to most ears as a similar prophesy respecting wheat growing on Herschel island in the Arctic ocean would seem to-day.

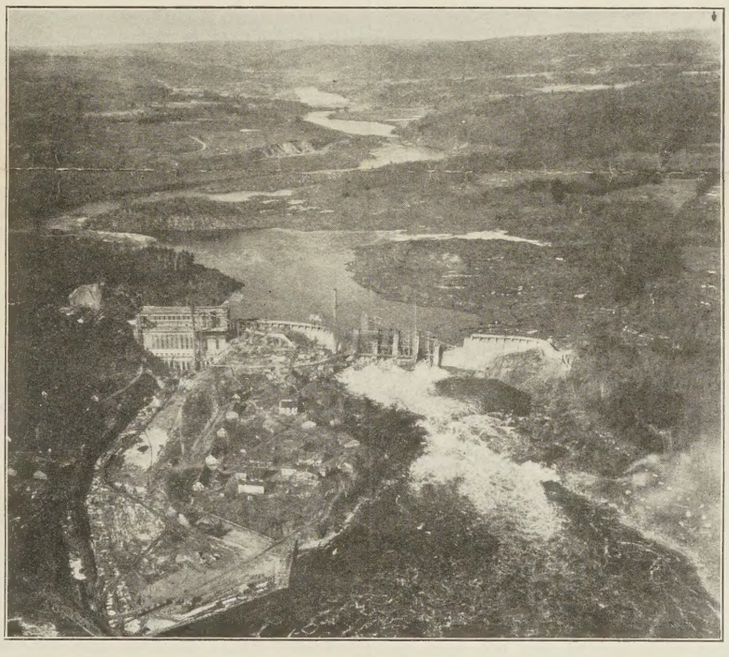
Another, not less important, point is that the Canadian West has carried off the wheat championship at fourteen of the sixteen annual shows held in connection with the International Exposition. On the other two occasions the title went to a grower in one of the states just south of the International Boundary. Canadian growers also secured first place in timothy seed, field peas, and alfalfa and stood high in barley, alsike clover, sweet clover, field beans, flax and rye. This brings out the fact, of which the Old World has long been aware, that, in the northern hemisphere, the farther north any plant or animal can be brought to perfection the higher will be its quality and that of its near descendants. By an international agreement recently completed alfalfa and red clover seed for export must now be coloured to indicate the country of origin. To Canada has been assigned the colour violet and that colour has already become a trade mark of great value throughout not only North America but the rest of the world as well.

(Continued on page 2)

WATER-POWER PROGRESS IN 1926

Annual Statement of Minister of the Interior Outlines Growth of Industry in Canada During Past Year

The annual statement of the Honourable Charles Stewart, Minister of the Interior, regarding the development, distribution, and use of hydro-electric energy in Canada confirms his estimate made a year ago that during 1926 more than 250,000 horse-power would be added to the total hydro-electric development of the Dominion. The actual figure is 266,000 horse-power and the total installation now amounts to 4,556,000 horse-power. The new installations represent a direct investment of at least $25,000,000 without regard to new capital required in the application of the power.



Water-Power Progress in 1926—The Chelsea development illustrated above is one of three hydro-electric plants being constructed by the Gatineau Power Company on the Gatineau river in the province of Quebec. This plant which will have a capacity of 170,000 horse-power was practically completed during 1926. Power from the Chelsea, Farmers Rapids, and Paugan Falls plants will go to the new mill of the Canadian International Paper Company at Gatineau, Quebec, and also to the Ontario Hydro-Electric Power Commission.

New hydro-electric enterprises require several years to progress from the prospect stage to the actual production of power, but from the time of the completion of the initial unit until the full capacity of the site is reached, a station continues to record increases as new units are added. The record installation of 1925 was, in a considerable measure, due to the bringing of existing stations up to capacity and it was therefore inevitable that the new units added during 1926 should reach a more modest total. Nevertheless 1926 was, even more than 1925, a banner year in hydro-electric enterprise. Projects were actually under way which will ultimately add 1,700,000 horse-power to the total development, while three plants comprising a single enterprise, will have a capacity double that of the entire new installation during 1926. Of these three plants, two are nearly completed. In addition to the projects actually under construction others involving a further 1,000,000 horse-power are in active prospect. A direct investment, therefore, of $270,000,000 at least may be expected in Canada's hydro-electric industry during the next few years, with a further and much larger investment in industries and equipment for the distribution and utilization of this new supply of power.

The water-power industry of the Dominion is a product of the twentieth century and in its early years was sustained by the vision and skill of engineers backed by the foresight and energy of a few financial leaders. New problems had to be met and overcome without the assistance of adequate physical data, or of experience in simi-

(Continued on page 3)

8,000,000 TREES AWAIT SHIPMENT TO PRAIRIE HOMES

1927 DISTRIBUTION TO BE LARGEST YET

Western Landscape Changes As Tree Planting Work of Department of the Interior Progresses

During the season of 1926 the Forest Service of the Department of the Interior, through the forest nursery stations at Indian Head and Sutherland, Saskatchewan, sent out 5,512,425 little trees for planting on prairie farms, and since the beginning of this work in 1901 the total number of trees so sent out has been a little over 87,500,000.

The resulting plantations are not part of a wood-lot scheme, the trees being usually set in strips or shelter-belts about the farm buildings, but a new idea is gained of the extent of the work when it is learned that the 1926 plantations covered a little over 2,000 acres, and that the total plantings made since the inauguration of the scheme exceed in extent 32,000 acres. Thirty-two thousand acres represents an area of fifty square miles or nearly a township and a half. The plantations referred to, if grouped thus by themselves, would form but a small patch in the immensity of our Middle West but, as explained in the beginning, they are not "by themselves" in any sense but form part of a vast scheme, which has already made more homelike and more comfortable 80,300 farm homes, and given an artistic, cheerful touch to many rural school grounds in the Prairie Provinces.

The aim of the Department of the Interior has been to give farmers a start so that once a plantation was established the seeds and cuttings from it could be used to begin other shelter-belts. That this is the way in which the scheme has worked is indicated by the fact that under the influence of these eighty thousand original plantations the general appearance of the prairie in many sections is gradually changing and on all sides there are splendid examples of cosy farm homes, set amid well planned shelter-belts and surrounded by gardens containing bush and tree fruits. It has been demonstrated that, by breaking the force of high winds and by conserving moisture, shelter-belts increase the production of the farm but they return a dividend a hundred-fold greater in the increased comfort and enjoyment afforded by them to the farmer and his household.

The shipments of 5,512,425 seedlings and cuttings in the spring of 1926 were

(Continued on page 2)

STEADY PROGRESS IN MACKENZIE DISTRICT

Development Work Goes Forward in This Part of Northern Canada

The work of providing means of communication and other amenities and necessities of civilization in the Mackenzie district in the Northwest Territories goes steadily forward. The administration of this area is carried on by the North West Territories and Yukon Branch of the Department of the Interior, and every year an officer is sent from Ottawa to view conditions and to gain information as to local needs. This year Mr. John F. Moran, inspector of the branch, made his third trip which extended to Aklavik at the mouth of the Mackenzie and occupied four months.

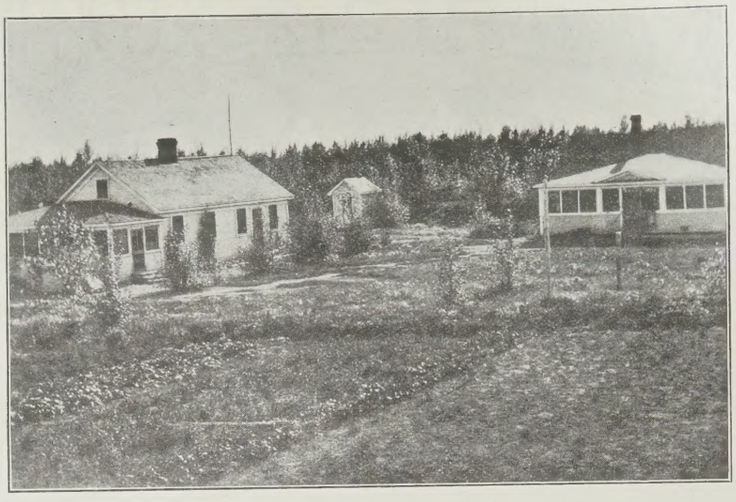
The posts which show the greatest signs of growth are Fort Smith, Simpson, and Aklavik. Progress at these points has been assisted by the establishment in each of them of wireless stations, which keep these communities in touch with the outside world. The chain of stations which includes Edmonton, Alberta; Fort Smith, Simpson, and Aklavik in the Northwest Territories; and Mayo, Dawson, and Herschel in Yukon, has proved a great boon to all interests in the country.

Trapping which is still the main industry has been good, and considerable prospecting for minerals has been going on during the summer; in one case an aeroplane was used to carry prospectors to their base of operations.

The health of the natives, on the whole has been good, and each year shows an advance in the application of the principles of hygiene. There are now four physicians in the Territories, located at Fort Smith, Simpson, Aklavik, and Resolution, and there are hospitals at the three first named of these places. Court was held at Aklavik by Judge Dubuc of Edmonton, the stipendiary magistrate for the Northwest Territories. Two natives were charged with manslaughter, one was acquitted and the other sentenced to two years detention at the Royal Canadian Mounted Police post at Herschel. The whole adult population at Aklavik attended the trials, and it is clear that the holding of these courts and the explanation of the law there given are having, along with the work of the Royal Canadian Mounted Police and missionaries, a good effect on the natives throughout the whole north country.

At Aklavik which is the gathering place of Eskimos from a long stretch of the Arctic coast there were in early July between twenty-five and thirty small schooners, with auxiliary gasolene engines, all belonging to Eskimos. These schooners, which range up to 48 feet in length are built in Edmonton to the order of Eskimo hunters and are brought down the Mackenzie and delivered to the purchasers at Aklavik. As soon as trading is over the Eskimos disperse, sailing in their schooners to their fishing, sealing, and hunting locations along the coast, not to return to Aklavik until the following midsummer. Viewed by old-time Eskimo standards these boats are of course costly, but they so facilitate hunting that they are considered profitable investments.

Reports from the superintendent of Wood Buffalo park near Fort Smith indicate that the sixteen hundred buffalo taken north in 1925 had settled down and were thriving, and that the 2,000 added in the summer of 1926 had already made themselves at home. As this area, which has been the habitat of the wild wood buffalo for many years, was selected by the buffalo themselves out of all the surrounding country, it is evidently a natural buffalo range, which accounts for the quickness with which the buffalo from Wainwright adapt themselves to their new surroundings.



Tree Planting on the Prairies—The rapidity with which trees set out in shelter-belts and wind-breaks begin to show results is indicated in this picture taken on an Alberta farm. These trees were planted in 1922 and the photograph was taken during the summer of 1926. Note the fine garden and homelike appearance of the surroundings.

8,000,000 TREES AWAIT SHIPMENT TO PRAIRIE HOMES

(Continued from page 1)

distributed among 5,590 farms in Manitoba, Saskatchewan and Alberta, and during the season an increased stock of material was prepared for distribution in 1927. Over 7,903,000 seedlings and cuttings are all ready for packing to meet the 6,200 applications which have been approved by the inspectors.

Under the conditions governing the distribution of this shelter-belt material any farmer living on the open prairies may secure a reasonable number of seedlings and cuttings by making application to the Tree Planting Division, Forest Service, Department of the Interior, Indian Head, Saskatchewan. In order to get the trees to plant in the spring of 1928 the application must be sent in before March 1, 1927. During the summer of 1927 the ground on which the trees are to be planted must be thoroughly summer-fallowed and an inspector will be sent to visit the farm of the applicant to see that this is done and also to advise him in regard to the arrangement of the belts and methods of planting and caring for the trees.

During the summer of 1926 the farms of 11,200 applicants were inspected. Many of these had already planted trees during the past two or three years and reports indicate that in spite of the rather dry, hot period in June and July the newly planted stock has come along splendidly. This result would not have been possible if the soil on which these trees were planted had not been well summer-fallowed during the previous season.

Many of the older plantations set out from fifteen to twenty years ago are now furnishing their owners with considerable material, which can be thinned out without in any way injuring the plantations and which is suitable for fence posts, rails, summer fuel, etc.

Every farmer who has not already done so should avail himself of the opportunity of securing well sheltered home surroundings with practically no cash expenditure except for the transportation of the young trees from the Nursery to his nearest express office.

INDIANS PROMINENT IN PLOUGHING MATCHES

Carry Off Prizes in Ontario Contests—Many Hundred Competitors Took Part

Ploughing matches are a feature of Canadian rural life. The contest held in the Niagara district in the autumn of 1926 on the ground where the battle of Lundy's Lane was fought in 1814 was of a most happy international character, the descendants of the antagonists of earlier days contesting every foot of the field—with ploughs instead of muskets and bayonets. There were many hundreds of competitors and every kind of ploughing implement was used from wooden ploughs drawn by oxen down to the most modern forms.

The intense interest taken in this fundamental farming operation is considered a most encouraging sign, and periodicals, both daily newspapers and agricultural journals, gave the match a great deal of space and prominence. Viewing it solely from a technical standpoint, an agricultural journal noted that one of the striking features of this three-day event was the part played by the twenty-eight Indian competitors from various Indian reserves, who ploughed with such skill as to obtain good places, one of their number carrying off the coveted sweepstakes prize for the best ploughing in stubble.

This brief statement shows that the Indians in Ontario, like their brethren in the West, are taking their part in the various activities of the community.

CANADIAN SEED AGAIN AWARDED HIGHEST HONORS

(Continued from page 1)

Favoured as Canada is in respect of seed production the position she now occupies has not been attained by accident, and it is to be noted that the winners in recent years have ascribed no small part of their success to the work of the federal and provincial departments of agriculture, to the agricultural colleges, and to the administrative organizations maintaining the standard of Canadian seeds.

DOGS SOLVE TRANSPORT PROBLEMS OF FAR NORTH

Play Important Part in Development and Trade of Northern Canada

In the isolated and colder parts of Canada, beyond the influence of railway, automobile, or horse, the power for travelling and transport of supplies throughout the winter months is furnished by dogs, and dog teams are frequently used by officers of the Department of the Interior in carrying out patrols, surveys, and other work.

Four, and sometimes five, dogs constitute a team. These can pull loads of about four hundred pounds per team over snow, and much heavier loads across glare ice. The dogs are attached Indian file to the toboggan, the harness consisting of leather collar, saddle, and traces. The lead dog of necessity has to be an animal of more than usual intelligence as his task is to locate and follow a formerly used trail that may be hidden beneath a recent fall of snow; to tell, probably by instinct, whether the ice underfoot is safe or dangerous; and to obey the driver's shouts of "mush" (go on), "whoa" (stop), "cha" (left), and "hwie" (right). The dog nearest the toboggan is generally a strong beast, whose duty is to keep the toboggan on the trail.

On hard snow or ice the dogs will easily perform their task, encouraged only by the shouts and the crack of the whip of the driver, who runs behind or to the side, or even rides on the load. Where the snow is soft or deep, however, it is necessary for the driver to go ahead, breaking and hardening a trail with his snowshoes.

The feed of dogs during the working season, usually consists of fish which are netted during August and September, and hung in the open air to cure. They are fed to the dogs in this dry preserved state. Dogs on long and hard trips are often given a mixture of boiled cornmeal and tallow, for which they show a great fondness. Feeding time comes once a day, usually in the evening, when the hungry dogs gambol like children, and bark delightedly, as the driver approaches with the food.

When the snow is fairly soft the dogs have little foot trouble, but on very hard crust or ice the pads of their feet become much worn, and crack and bleed. To guard against this a little bag or moccasin made of canvas or hide has to be pulled over each paw, and tied in such a way that the dog cannot easily get it off.

The toboggan is used in northern Canada. This has attached to it a square stern-piece, and between this and the front is stretched a long open bag of canvas or hide in which the load is packed. The whole load when built up is well lashed with ropes and is quite rigid. A toboggan may be used without runners in the woods and during very cold weather, but as spring approaches and melting ice and wet snow are met with, metal shod runners are attached to make easier hauling for the dogs.

Production of paints, pigments and varnishes in Canada, according to the Dominion Bureau of Statistics, amounted in value to $22,234,268 in 1925, an increase of 9 per cent over the output value of $20,200,824 in 1924.

NATURAL RESOURCES CANADA

PUBLISHED BY

THE DEPARTMENT OF THE INTERIOR

HON. CHARLES STEWART,
Minister
W. W. CORY, C.M.G.,
Deputy Minister

Natural Resources, Canada, is published monthly for the purpose of promoting interest and supplying information respecting Canada's natural resources and their development. Applications to receive this publication and inquiries respecting any matter or document dealt with should be addressed to the Secretary, Department of the Interior, Ottawa.

Natural Resources, Canada, is published in French as well as in English.

OTTAWA, JANUARY, 1927

WATER-POWER PROGRESS IN 1926

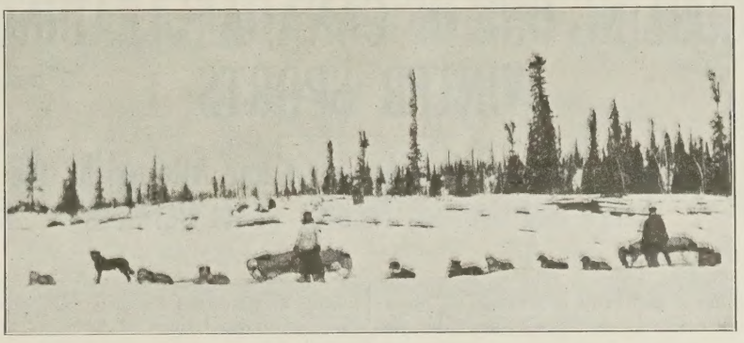
(Continued from page 1)

lar work elsewhere. The problems to be solved involved the whole gamut of science, and present installations embody a wide range of new knowledge concerning construction, hydraulics, mechanics, and electricity. The modern installation shows but little similarity in either layout or construction to the pioneer plants but these earlier plants were nevertheless extremely successful and by their success they have made all that has followed possible. Now, the investing public is not only willing but anxious to invest funds in any properly sponsored hydro-electric enterprise and 1926 has shown, by the extraordinary advances recorded in the quotations for power securities, the high reputation they enjoy.

The confidence thus shown is in no small measure due to the elimination of guesswork as the basis of development. Nearly twenty years ago the Department of the Interior commenced the work of accumulating basic water resources data. Beginning first in the Prairie Provinces and in the Railway Belt of British Columbia the work spread on a co-operative basis to other provinces with the result that there has been for some years a Dominion Hydrometric Survey (carried on by the Dominion Water Power and Reclamation Service, ably seconded by the co-operating provincial authorities), engaged in the systematic and uniform accumulation of basic water resources data throughout Canada. In consequence the all-important question of water supply is no longer one of uncertainty.

The extraordinary value of Canadian water-power lies in its low cost which is such that it enables industry to utilize it to the full. The pulp and paper industry relies almost entirely upon water-power as, excluding coal mining, does the mining industry. The value of the production of these two industries alone is enormous and if to this be added the value of the output of the numerous manufactories utilizing this source of power and of the municipal and domestic services rendered, it becomes evident that water-power is one of the principal foundations of our national prosperity.

The outstanding activities during 1926 occurred in the province of Quebec, although some of the greatest of these are not reflected in the total of new installations as they did not reach the production stage. In British Columbia and Manitoba noteworthy advances were recorded while in the remaining provinces progress was made on a number of promising projects.



Transportation Problems of the Far North—The above picture was taken during survey operations on Great Slave lake by a party from the Topographical Survey, Department of the Interior. The teams are moving supplies and equipment across the frozen surface of the lake.

In Quebec 168,000 horse-power was installed, 90,000 of which was in the Ile Maligne station of the Duke-Price Company on the Saguenay river. This increases the installation there from 360,000 to 450,000 horse-power, the ultimate capacity being 540,000 horse-power. Of the remaining installations two may be mentioned: the replacement of a 1,600 horse-power development by one of 22,200 horse-power on the Batiscan river by the Shawinigan interests and a 16,800 horse-power addition at the Kipawa plant of the Canadian International Paper Company. The latter company is also responsible, through its subsidiary the Gatineau Power Company, for the greatest hydro-electric construction work during the year. Two plants on the Gatineau river, one at Chelsea of 170,000 horse-power and one at Farmer's rapids of 120,000 horse-power were nearly completed by this company, while a third at Paugan Falls of 240,000 horse-power was begun. Progress was also made on another and larger development, that of the Aluminum Company of Canada at Chute-a-Caron on the Saguenay river where a development of 800,000 horse-power ultimate capacity is in course of construction. This company is already operating its reduction works at the new town of Arvida with power from Ile Maligne. The Ontario Paper Company commenced the construction of a 40,000 horse-power station on the Outardes river.

The Quebec Streams Commission continued its valuable work in connection with construction and operation of storage reservoirs in the interest of power development, and is at present directing the construction of the Baskatong reservoir on the Gatineau river which is being carried on by the Canadian International Paper Company.

There was a lull in hydro-electric development in Ontario due to the completion in 1925 of a heavy construction program, the principal units of which were the Queenston-Chippawa plant at Niagara and the Cameron Falls plant on the Nipigon river. These two stations of the Ontario Hydro-Electric Power Commission with 550,000 horse-power and 75,000 horse-power capacities respectively were completed in 1925. Before undertaking a further heavy program the Commission has availed itself of a block of about a quarter of a million horse-power from the Gatineau plants above referred to and has contracted for this power, delivery to commence in 1928. The Commission has other large enterprises in view which, together with the developments already commenced of the Spruce Falls Company at Smoky Falls on the Mattagami river and of the Backus-Brooks Company on the Seine river, of 70,000 horse-power and 37,620 horse-power respectively, will maintain Ontario in its high place amongst the water-power provinces of the Dominion.

New development in British Columbia was but little behind that of last year and amounted to 45,860 horse-power. Of this 25,860 horse-power was contributed by the Powell River Company and 20,000 horse-power by the West Kootenay Light and Power Company, which, by the addition of its third unit, completed its 60,000 horse-power plant at Lower Bonnington Falls on the Kootenay river. This company is carrying on preliminary work in connection with a new 60,000 horse-power development at South Slocan. The British Columbia Electric Railway Company completed its storage dam at the outlet of Alouette lake and proceeded with the construction of the 12,500 horse-power Alouette power station. The same company also continued with its Bridge River project, the initial capacity of which will be 54,000 horse-power and the scheme as a whole is expected to have an ultimate capacity of from 550,000 to 700,000 horse-power.

In Manitoba additions to the existing plants of the city of Winnipeg and the Manitoba Power Company amounted to 43,200 horse-power, 15,200 horse-power of which was represented by the addition of units 15 and 16 to the city's station at Point du Bois on the Winnipeg river. This plant is now completely installed and has a capacity of 109,000 horse-power. At Great Falls on the same river the Manitoba Power Company installed unit No. 3 of 28,000 horse-power capacity and let the contract for a similar unit to be installed during 1927. In addition the company completed the work necessary to permit the forebay level to be raised so as to provide the full designed head, and built a steel-tower transmission line from the plant to the mill of the Manitoba Paper Company at Fort Alexander.

In New Brunswick 2,600 horse-power of new installation was due to the replacement of a unit in the plant on the Aroostook river of the Maine and New Brunswick Electrical Power Company. The chief activity, however, was the initiation of work at Grand Falls on the St. John river where construction of an initial installation of 60,000 horse-power was begun by the St. John River Power Company. The New Brunswick Electric Power Commission carried out further work in connection with its Musquash system and is investigating the Meductic Falls site on the St. John river about 40 miles from Fredericton. The Bathurst Company has investigated the Nipisiguit river; it is thought that some 40,000 horse-power will be developed for use in the company's pulp and paper mills.

In Nova Scotia a 300 horse-power unit was added to the Nova Scotia Power Commission's Mushamush development. This Commission is building two new storage dams on East River Sheet harbour, is extending its transmission system, and has in prospect further developments for the St. Margaret's Bay system and on the Medway river. Among other active projects in Nova Scotia is a 330 horse-power plant now under construction at the upper falls of the Sissiboo river for the supply of Weymouth, Digby, and Smith's Cove, and projected developments at Avon River Falls and on the Tusket river, the last named being intended for the supplying of power to Yarmouth.

While the new installations in 1926 fell considerably short of 1925, the work initiated greatly exceeded the record of that year, and for this reason very substantial installations may be looked for not only during 1927, but in succeeding years.

INDIAN PLACE-NAMES OF PRINCE EDWARD ID.

Geographic Board of Canada Indicates Indian Names in Use Today

Indian names are not always euphonious but dissonance cannot be charged against the Micmac names of Prince Edward Island. The Indian name of the island was *Epagwit,* meaning "at rest on the water" and many think it is a pity that this poetic name has not survived.

Only nine Indian names are in use today, according to the Geographic Board of Canada, namely, Bedeque bay, Cascumpeque bay, Malpeque bay, Mininegash pond, Miscouche point, Pisquid river, Shemody river and point, Tignish river, and Tracadie bay. Such spellings as Bedeque, instead of Bedek; and Malpeque, instead of Malpek, show that the survival of the names is due to the French whose connection with the island began with the voyage of Jacques Cartier in 1534. There is the further evidence that while French maps show the foregoing Indian names, the first English map of the island, made in 1765 by Captain Holland, shows not a single Indian name save in a secondary place; Bedeque bay being named "Halifax," after the Earl of Halifax; Cascumpeque bay, "Holland" after Lord Holland; and Malpeque bay, "Richmond" after the Duke of Richmond.

Bedeque means "the hot place"; *Cascumpeque,* "bold sandy shore"; *Malpeque,* "large bay," *Mininegash,* "portage place"; *Miscouche,* "little grassy island"; *Pisquid,* the "forks of a river"; *Shemody,* "spear pole place"; *Tignish,* "paddle," and *Tracadie,* "camping ground."

The recent publication of the Geographic Board of Canada *Place-names of Prince Edward Island,* states that "Canceaux" (point and cove) is a transplanted Indian name. It commemorates Captain Holland's ship the *Canceaux,* in which he spent the winter of 1764-5 in the cove. The ship was called after cape Canso, Nova Scotia, sometimes spelled by the French, "Canceaux." *Canso* is Micmac Indian for "high banks opposite."

CANADA'S POTENTIAL RESOURCES OF OIL*

Results of Prospecting Are Highly Encouraging and Indicate Promising Possibilities

The petroleum oil fields that have so far been found and developed in Canada have produced, during a period of 65 years, some 27,000,000 barrels of crude petroleum, or less than 2½ per cent of the present annual world output.

It is evident that, in Canada, oil fields have not yet been found that may be compared in extent of output with the great oil fields of other parts of the world. Intensive prospecting is under way at the present time, the results of which, particularly those of the Turner Valley field in Alberta with its phenomenal individual well output of light oils and gas, are highly encouraging, and indicate possibilities for the future discovery of natural oils in great volume.

Canada, however, is rich in potential resources of oil which will undoubtedly be utilized when the world's petroleum fields begin to show actually serious diminution of output and approaching exhaustion.

Processes for the complete liquefaction of coal by means of high pressures and temperatures and by catalytic action were prominent in the papers and addresses presented at the recent International Conference on Bituminous Coal held at Pittsburgh, Pennsylvania, U.S.A. Indeed the outstanding feature of this meeting is reported to have been a practically unanimous conclusion that the solid fuels, including the bituminous and lignite coals of all kinds, will, when natural petroleum sources are exhausted, prove to be the principal sources of oil. This conclusion is of the greatest significance to Canada in view of the country's enormous coal resources.

The rapidly increasing demand for liquid fuels of all descriptions, coupled with the threatened depletion of the natural oil resources of the United States, from which Canada derives the major portion of her oil supplies, has already directed attention to the enormous bituminous sand deposits of the province of Alberta and the oil shale areas of the Maritime Provinces. The development and perfection of cracking processes, which make it possible to recover high percentages of motor spirits and other oils from petroleum residuum, the bitumen of bituminous sand and shale oil, has brought into prominence the possibility of utilizing the bituminous sands of Alberta and the oil shales of the Maritime Provinces for the manufacture of such petroleum oil products. It has been estimated that the bituminous sands of Alberta can supply raw material for manufacturing motor spirits and other oils sufficient to supply the demands of the world for many years. The oil shale resources of the Maritime Provinces, though they have not been examined in sufficient detail to permit of even a rough estimate of their total oil content, are believed to be of enormous extent. These great resources in coal, bitumen and oil shale thus constitute most valuable assets as potential resources of oil.

**Prepared at the direction of Dr. Charles Camsell, Deputy Minister, Department of Mines, Canada.*

CURLING ONE OF CANADA'S LEADING WINTER SPORTS

Popularity of Royal and Ancient Game Attested by the Large and Growing Number of Its Devotees

Curling, which is akin to the summer game of golf in its appeal and its physical demands, is rapidly becoming one of Canada's most popular winter pastimes. The ideal conditions which prevail during the winter season have gained for the Dominion the name of "The Curlers' Paradise." Nearly every province has its branch of the Royal Caledonian Curling Club of Scotland, the parent body of the sport, and every sphere of social life in Canada is represented among its devotees.

Curling in Canada—The Canadian winter season offers unexcelled opportunities for the enjoyment of this great game in nearly every part of the Dominion. The above illustration shows a group of enthusiasts engaged in play on a lake in the Laurentian hills.

Apart from the intense interest aroused by the game itself, curling wields other and more potent influences. Wherever curlers meet there is formed a brotherhood of goodfellowship in which men from all walks of life fraternize and in which the honours go to him who makes the best shot. The best curler is the man who "plays the game" and the qualities so developed are reflected in the success of the individual in the social and business life of the country.

Just when the first curling match took place in Canada is uncertain. It is claimed that the Highlanders who served under General Wolfe played the game at Quebec and there is little doubt that curling was played in other parts of Canada (Lower and Upper) before the formation of the Royal Montreal Club in 1807. Although Quebec city claims the distinction of the first match, its senior club was not formed till 1821, while the first club in Halifax is just over a century old, having been founded in 1825. About the middle of the last century the clubs in what is now known as Quebec and the eastern part of Ontario were organized into a branch of the Royal Caledonian Club, and this branch has grown until it now comprises 64 clubs (of which 18 are ladies' clubs) and a total membership of about 4,000. With the founding of clubs in other parts of the Dominion, provincial branches of the Royal Caledonian Curling Club were organized. In round numbers there are 20 clubs in Nova Scotia, 15 in New Brunswick, and 115 in central and western Ontario. Of those in the Ontario branch at least six are ladies' clubs.

The popularity gained by curling in the Prairie Provinces of Manitoba, Saskatchewan, and Alberta is remarkable. The sport in the Canadian West dates from about 1876 when a few games were played on the Red river in Winnipeg. Almost immediately a club was started and the first club matches were played in a tent on the present site of the Grain Exchange building. Soon afterwards a permanent rink building was erected. In 1888 the Manitoba Curling Association, which is affiliated with the Royal Caledonian Curling Club of Scotland, was formed, by six curling clubs, two from Winnipeg and four from other points in the province. In 1900 there were 87 curling clubs in the western provinces and in 1926 Manitoba alone had 146 clubs with a membership of over 5,056. The organized clubs in the West affiliated with the Manitoba Curling Association are at present as follows:—

	Clubs	Members
Manitoba Association....	146	5,056
Saskatchewan Association	74	2,934
Alberta Association.....	19	900

In the interior of British Columbia curling is played and the game is gaining in popularity. There are the British Columbia and Kootenay branches of the Royal Caledonian Club with between twenty and thirty clubs affiliated. A number of other clubs in the province are affiliated with the Crowsnest branch.

Curling is one of the leading sport activities in the Canadian national parks. The great scenic areas of the Canadian Rockies have gained an important place among the summer resorts of the North American continent and their fame as winter playgrounds is rapidly spreading. At Banff, in Rocky Mountains national park, Alberta, the annual winter carnival attracts many devotees of outdoor pastimes, and prominent among the many features is the bonspiel held by the Banff Curling Club. Last year fifteen rinks from outside points took part and preparations are being made this season for the accommodation of a greatly increased number of curlers during the annual competition. At Jasper, in Jasper national park, a club was formed last year and the first bonspiel held with marked success. In connection with last year's carnival and ski-jumping championships at Revelstoke in Mount Revelstoke national park, the Interior Curling Association held a bonspiel which attracted twenty-four rinks from local and outside clubs. At all these points the keenest of ice is available under conditions that are most enjoyable.

The curling season in Canada starts about December 15 and continues until about the middle of March. For the greater part of four months the "roarin' game" holds sway in nearly every Canadian city and town and its devotees are numbered in thousands. In the cities where the game is played in covered rinks, there is little or no interruption from thaws. However in the towns and villages where pond or lake supplies the surface, the weather is always an important factor in the success of the season's play.

Bonspiels are held in nearly every section of the Dominion, and many inter-club competitions are carried along. In the Maritimes the important event of the season is the series of interprovincial contests for the McClelan cup, donated by the late Hon. A. R. McClelan, former Lieutenant-Governor of New Brunswick. The annual competition for the Governor General's trophy is one of the blue ribbon events of curling in Eastern Canada, the finals taking place on the rinks at Rideau Hall, Ottawa, the official residence of the Governor General of Canada. Each provincial branch in the West holds its regular inter-club contests but to curlers in the Prairie Provinces the Winnipeg meet, which has become the greatest bonspiel in the world, is the big event of the season. Matches are held at intervals between Canadian and Scottish rinks, alternately in Scotland and in Canada, for the Strathcona Cup, and the skill Canadian curlers have attained is attested by the success they have achieved in a series of years in these contests.

As each succeeding year rolls by there is a greater appreciation of Canada's winter season. The appeal of the out-of-doors is becoming as strong during the months of ice and snow as in the summer time, and no small part in this beneficial movement is due to the popularity of curling. Both sexes are enjoying this great sport and, as in other lines of outdoor recreation, with benefit to the national health.

GAS AND OIL REGULATIONS

The regulations for the disposal of petroleum and natural gas rights in lands, the mineral rights in which are the property of the Crown in the provinces of Manitoba, Saskatchewan, and Alberta; the Northwest and Yukon Territories; and in the Railway Belt and Peace River Block of British Columbia, have recently been reprinted in order to include additional regulations governing boring operations, which became effective on October 18, 1926.

Copies of the regulations may be obtained on application to any agent of Dominion Lands, or to the Mining Lands Branch, Department of the Interior, Ottawa.

NATURAL RESOURCES CANADA

Published by DEPARTMENT OF THE INTERIOR, Ottawa.

VOL. 6 FEBRUARY, 1927 No. 2

CANADIAN MINING MADE NOTABLE ADVANCE IN 1926*

ACTIVITY IN LEAD, ZINC AND COPPER

Indications of Further Increases in 1927—Gold Production Exceeded $35,000,000

The mineral industry of Canada is making notable advances and during 1926 made a very gratifying contribution to the general prosperity of the country. An estimate made by the Dominion Bureau of Statistics places the value of the mineral production for 1926 at $242,886,000. This is more than seven per cent greater than the total production for 1925, which amounted to $226,583,333.

A few outstanding features that have had a bearing on the increase in production and that indicate further increases in the future are worthy of note.

There was a marked increase in the production of lead, zinc, and copper. British Columbia contributes most abundantly of these minerals. A great proportion of the lead and zinc comes from the Sullivan mine in the south-eastern part of the province. Extensions have been made recently in the plants for the treatment of the Sullivan ore and the lead and zinc ores of other mining camps of the province. These account for the increase in production. Ore reserves have been proved to be very great, and it is expected that a heavy production will continue for many years.

The copper deposits of Allenby mountain near Princeton have at last come into successful exploitation and the concentrator with a capacity of 2,000 tons a day has been in full operation. The two other large mines of the province, at Britannia and at Anyox, have been centres of great activity. The Ontario production is from the nickel-copper ores of Sudbury mining district. Further increases in copper production may be expected when in about a year the new mining camp of Rouyn and vicinity begins making an output. The completion of the railway line from Taschereau has solved the problem of transportation and will permit of the erection of the necessary plants for the mining and smelting of the ores. Ore bodies of great value have been proved, the

** Prepared under direction of Dr. Charles Camsell, Deputy Minister, Department of Mines, Canada, by Mr. Wyatt Malcolm, Geological Survey.*

(Continued on page 2)

THE SPORTS CARNIVAL IN CANADA

In February Winter Recreational Activities Are at Their Height—Most Enjoyable Period

In Canada, February is pre-eminently the month of sports carnivals. Winter sport activities throughout the Dominion have reached their climax at this period of the season and competitions to decide supremacy in practically every line of recreation are held during this month. Skating, snowshoeing, tobogganing, ski-ing, curling, hockey, and other forms of outdoor recreation which have been in full swing from November or December, are at their height and both novices and the more experienced have reached such a state of proficiency that the carnival becomes a most fascinating and thrilling spectacle. The enthusiasts thus brought together vie in their efforts not only to be supreme in the various contests but also to exhibit the superiority of their favourite sport. However, the fraternal spirit, which prevails wherever lovers of the great outdoors congregate, makes the carnival an event of the greatest enjoyment and interest both for the participant and the spectator.

The Winter Sports carnival in Canada—(Left) Parade of snowshoers passing along a street in upper town, Quebec city. (Right) Tobogganing on a Mount Royal slide, Montreal.

Such typically Canadian winter sports as tobogganing, snowshoeing, and dog-team racing hold a prominent place and much of the glamour of a Canadian winter carnival centres in the colourful and picturesque costumes of their enthusiastic followers. Canada is the birthplace of the toboggan and the snowshoe, consequently Canadians have always been the leading exponents of the use of these means of locomotion. Long before Jacques Cartier sailed up the St. Lawrence the Indians had brought these implements to a state, almost, of perfection and the white man, seeing how well they were suited to conditions in the country, adopted them and emulated—even outdistanced—the Indian in their use. The snowshoe and the toboggan are woven into our early history. Their place in the development of Eastern Canada and central British Columbia is well known and it was, if possible, even more important in the Prairie Provinces and the Northwest Territories. In the latter country in a day that has only just vanished the Red River settlers were wont to gather inside the walls of Fort Garry on New Year's morning to see the "winter mail"—carried in toboggans drawn by dogs driven by men on snowshoes—start on its nine-hundred-mile run to Fort Edmonton. And to-day from half a dozen railheads similar winter mails start out to carry their precious freight to the more remote posts on Hudson bay, on the lower Mackenzie, and on the shores of the Arctic ocean itself. The automobile and the aeroplane are making history rapidly in Canada's northland but it will be many a long day before they will displace the racquets and the Indian sled.

In the north snowshoeing is a necessary form of transportation but in southern Canada it is a sport with all the traditions of a glorious past. It has its picturesque costume of blanket coat, tuque, and moccasins, and its songs and chansons in both English and French.

(Continued on page 4)

IMPORTANT WORK PLANNED FOR NATIONAL PARKS

TO OPEN KICKING HORSE TRAIL

New Highway Will Complete Scenic Loop Through Heart of Canadian Rockies

A number of important developments in connection with the Canadian National Parks are planned for 1927. The most outstanding of these will be the opening of the new motor highway to be known as The Kicking Horse Trail. The new road, the completion of which is awaited with keen anticipation by motorists, will throw open practically the whole of Yoho park to this form of traffic, and make possible a new highway loop of approximately 300 miles through the very heart of some of the most magnific nt scenery in the Rockies.

The completion of the Banff-Windermere Highway, which was opened for traffic in June, 1923, brought about a much heavier motor traffic to the Canadian Rockies. It enabled the motorist to pass through the two national reservations, the Rocky Mountains and Kootenay parks, crossing the main range by way of the Vermilion pass, and for the first time established direct communication in this area between the East and West.

From Castle mountain, near which the Banff-Windermere highway turns south, an extension of about 20 miles was built, at practically the same time, to beautiful Lake Louise, and the already existing road from this point to Moraine lake was brought up to the requirements of motor traffic. Once at Lake Louise, however, the motorist was less than five miles from the Great Divide, the famous Kicking Horse pass and the eastern edge of Yoho park.

To bridge this gap, in 1926, the Government completed and opened the first section of the new Kicking Horse Trail, a road of sixteen miles from Lake Louise, across the famous pass, and down the west slope of the main Rockies to Field, the headquarters of Yoho park. From Field existing roads led to the two most celebrated beauty spots—Yoho valley, with its remarkable cataract known as the Takakkaw falls, and lovely Emerald lake.

Early this season the final work will be completed on the second section of the road, that from Field to the west boundary of Yoho park, near Leanchoil, British Columbia, a distance of about twenty-one miles. The importance of

(Continued on page 3)

ENCOURAGING SHOWING BY INDIAN FARMERS*

Canada's Prairie Indians Harvested Big Grain Crop—Success in Cattle Raising

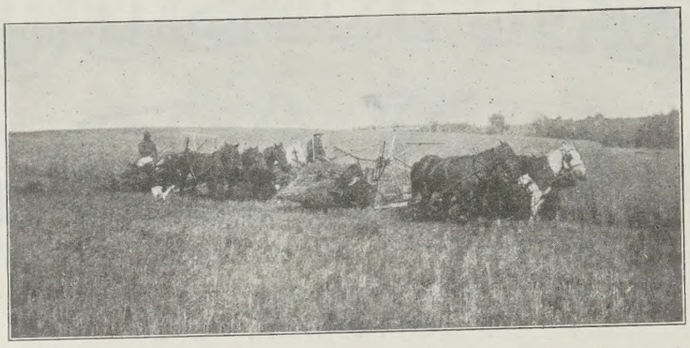
The Indians of the three Prairie Provinces—Manitoba, Saskatchewan, and Alberta—last season produced in round figures one million bushels of grain, of which just about half (488,000 bushels) was wheat. Canada's Indian wards are so scattered through all the provinces that it is not possible to deal with all of them, or all their problems, in one short article and this one deals only with the farming operations conducted on prairie reserves.

In this area there are about 35,000 Indians. The land reserved for their use includes some of the most fertile in the prairies and of this 97,000 acres were under cultivation in 1926. The very wet autumn of the past year rendered it difficult to harvest the crops and the returns were not as good, both as to quantity and grade, as they would have been had the season been normal. Nevertheless the crop was a profitable one and the Indians are preparing for increased farming operations in 1927.

In cattle raising the Indians of Canada's Middle West have been equally successful. They own in round numbers 25,000 head of cattle and 35,000 horses of good type. The beef cattle slaughtered by the Indians for their own use in 1926 were valued at $135,000, and those sold brought in $70,000. The Indians on one reserve received $15,000 from the sale of cattle. The quality of the cattle sold is indicated by the following facts. In 1925 two carloads of cattle raised by Indians took first and third prizes in open competition at the Winnipeg Feeder Show. This year the consignment was one day late for the show but the animals sold for top prices and it was stated by cattle men that had they arrived in time Indian owned cattle would have certainly won again. In October, 1926, twenty-five steers from the Blackfoot reserve took third prize at the Calgary Stocker and Feeder Show against a very large field, and at the auction sale the price received was the same as that for which the first prize carload was sold. These successes have encouraged the Indian farmers, and they also show that the policy of the Department of Indian Affairs in buying each year from 70 to 100 registered bulls is improving the grade of the range cattle on Indian reserves.

A notable feature, especially during the past few years, is that a good deal of the money secured from crops and cattle goes into farm machinery and new buildings. The result is that living conditions on the reserves are gradually improving. During 1926 the different bands in the Prairie Provinces voted from their tribe funds $32,000 for new buildings of a community character, and it is estimated that at least twice that amount was spent out of private earnings for the erection of buildings for individual owners. The results of the 1926 season on the whole are very encouraging.

**Prepared under the direction of Dr. Duncan C. Scott, Deputy Superintendent General of Indian Affairs, by Mr. W. M. Graham, Indian Commissioner, Regina.*



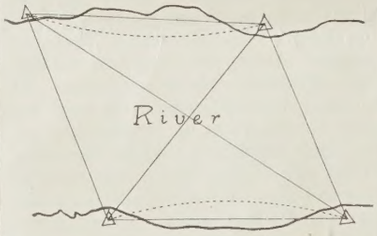
Harvesting Wheat on Keeseekoose Indian Reserve, Saskatchewan. Note the tall, even stand of grain and the fine teams of horses on the two binders. Indian farmers in the Prairie Provinces harvested just about one million bushels of grain in 1926.

HOW BENDING OF LIGHT RAYS HINDER SURVEYOR

Horizontal Refraction Met With by Geodetic Engineers at Different Points in Canada

When the blade of a straight oar is dipped into the water the submerged portion appears to take a direction different from that of the portion above the surface, giving the effect of an oar with a decided bend at the point of immersion. This bending is due to the fact that the ray of light, in other words the line of sight from the eye to the oar, is bent or refracted because the refractive power of water is greater than that of air.

This bending of lines which occurs whenever a ray of light passes through two or more mediums of different refractive power and which is to the layman only an interesting phenomenon, is the bugbear of the surveyor in his accurate measurements. The chief work of the Geodetic Survey of Canada is the determination of the exact positions of different points and their distances from and relations to one another. Geodetic surveys form the basis of all other surveys. The accuracy attained in these measurements is not commonly realized; it is such that should a 2-inch side of an erect scantling at a distance of 18 miles face the observer, the limit of error of angular measurement would be that caused by sighting on one edge of it, rather than on the other. To anyone standing on a hill at night and seeing a light across the valley it seems self-evident that he is looking straight at the light, whereas he may be, so to speak, looking at it along a curved line, so that the light does not appear in its true position.



This sketch illustrates the phenomenon of lateral refraction. It will be noticed that the lines of sight along the shore are bowed toward the river whereas those across the river are straight.

Vertical refraction is always expected, and allowed for, in observations of this kind. Horizontal refraction is not so common but one of the outstanding instances of lateral bending of light, noticed by officers of the Geodetic Survey, was met with when locating points along the lower St. Lawrence river. Here it was found that the lines across the river were apparently straight but that those along the shore were bowed toward the river. After many tests it was ascertained that this was caused by the fact that under certain conditions the air over the water was warmer, and therefore of a different density, at night when the observations were made, than that over the land, which fact caused the beam of light to be bowed toward the river and back to the instrument.

Last season in surveying lines along the Skeena river in British Columbia the phenomenon was noticed again but in this case a high cliff facing south and heated by the sun, raised the temperature of the air in its immediate vicinity and caused the rays to be bent toward itself, thus reversing the conditions found along the lower St. Lawrence river.

The deviation from the straight line in every case was very slight (in technical language from 3 to 20 seconds of arc) but still sufficient to render useless the calculations based upon the observation. In such cases surveyors overcome the difficulty by taking repeated observations on days, or at times of the day, when the layers of air over land and water are as near as possible of the same temperature and hence more nearly of the same density.

CANADIAN MINING MADE NOTABLE ADVANCE IN 1926

(Continued from page 1)

extent of favourable prospecting ground is large, interest is keen, and intensive xploration will be continued. The possibilities of this part of the province are regarded as of great promise. In addition to copper there will be a production of zinc, and gold is an important constituent of some of the ores.

A large ore body that bears great promise for the future is the Flinflon body of copper-zinc sulphides of the Pas mining district, Manitoba. An experimental plant is being erected on the property at heavy cost to ascertain the best methods of treating the ores and it seems almost certain that in time a big mining and smelting industry will be established at this point.

Gold continues to be the most valuable of the metallic minerals mined in Canada, according to output, which exceeded $35,000,000 in value in the year. In gold mining, Ontario is far in the lead. Better prices were obtained during the year for asbestos, although there was a slight falling off in the quantity produced. Of this mineral Quebec continues the most important producer in the world.

Few questions attracted greater attention in the mining world during the year than the oil possibilities of Alberta. The strike at a depth of 3,740 feet of a heavy flow of wet gas in Royalite No. 4 well two years ago, revived interest and as a result a great number of wells were drilled in different parts of the province in 1926, the greatest activity centering in the Turner Valley field and other points in the foot-hills. In two or three wells heavy flows of wet gas have been struck from which an important yield will be obtained but none is so productive as Royalite No. 4. Five hundred barrels of light oil is recovered daily from this one well and the gas after purification is piped to Calgary. Several wells have not yet reached the deep oil-bearing formation and the progress of drilling in these and in those situated in other parts of the province will be watched with great expectancy.

CANADA REPRESENTED AT GAME CONFERENCE

On Conservation of Feeding Grounds Depends Future Waterfowl Supply of Continent

From the standpoint of Canada the most important subject discussed at the Thirteenth National Game Conference, held in New York city December 6-7, 1926, was the conservation of marsh lands in the United States. Marsh lands are essential to waterfowl migrating between Canada and the United States as eeding places during migration and as laces to winter, and many different influences are affecting these marsh areas or causing them to disappear altogether. Legislation dealing with marsh conservation is before the United States Congress and Canadians concerned in any way with the subject of migratory birds are following its progress with interest.

Among the outstanding papers given at the conference was one by Dr E. W. Nelson, Chief of the United States Bureau of Biological Survey, on the marsh land situation. The Bear River marshes in the state of Utah have become alkaline and millions of waterfowl have died there because of this condition. By the banding of ducks and other fowl at these marshes it has been proved that the losses sustained there affect the supply in Alberta and Saskatchewan, and in every state west of the Mississippi, except Oregon and Washington. It was estimated that it would take $300,000 to restore and freshen the Bear River marshes and it was stated that this improvement would be the first to be undertaken under the proposed legislation.

In the discussion of this subject, so far as it related to Canada, it was pointed out that the supply of waterfowl in the Prairie Provinces would be seriously depleted if the Bear River and similar situations were not remedied. It was also stated that in the drier parts of the Canadian prairies similar losses of waterfowl on a smaller scale had occurred and that scientific studies of the causes were now under way.

Canadian conservationists were present at the conference in considerable numbers. The Department of the Interior, which is intimately concerned because of its responsibility in connection with the Migratory Birds Convention, was represented as were also several of the provincial game departments. Mr. W. W. Cory, Deputy Minister of the Interior, was elected a vice-chairman of the conference.

NATURAL RESOURCES CANADA

PUBLISHED BY

THE DEPARTMENT OF THE INTERIOR

HON. CHARLES STEWART,
Minister

W. W. CORY, C.M.G.,
Deputy Minister

Natural Resources, Canada, is published monthly for the purpose of promoting interest and supplying information respecting Canada's natural resources and their development. Applications to receive this publication and inquiries respecting any matter or document dealt with should be addressed to the Secretary, Department of the Interior, Ottawa.

Natural Resources, Canada, is published in French as well as in English.

OTTAWA, FEBRUARY, 1927

CANADA'S FORAGE CROPS A VALUABLE RESOURCE*

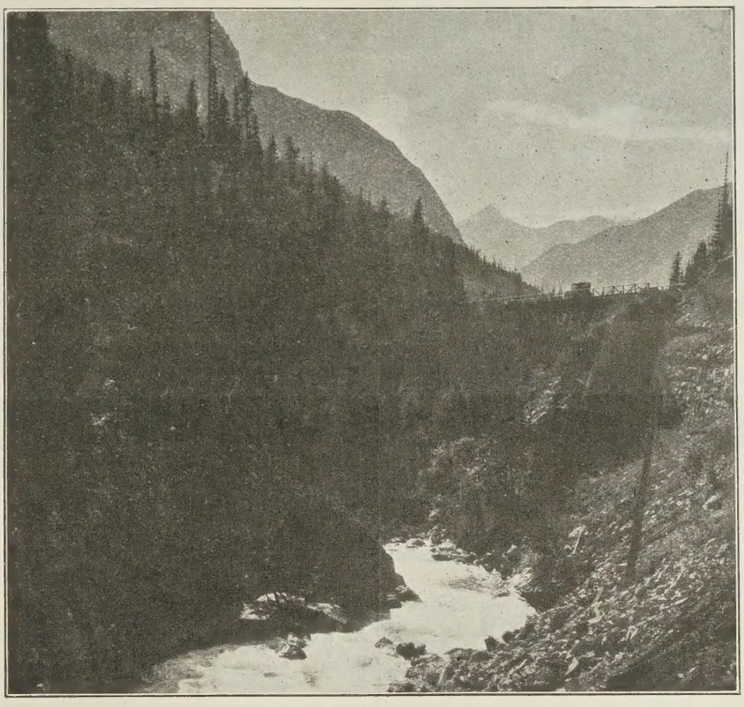
Remarkable Northward Advance of Alfalfa —Increase of Corn on Prairies

Nature's ability to provide for the continuance of plant and animal life under the diverse climatic conditions existing on this terrestrial body seems almost unlimited. Each peculiarity of soil or climate appears to have a compensating possibility, and hence it becomes the function of mankind to take advantage as thoroughly as possible of the opportunities presented. These assertions are borne out by reference to the production of forage plants in Canada. In spite of what some may consider climatic difficulties few countries are more richly endowed with regard to both indigenous and introduced fodder plants.

Even plants which had their origin in warmer climates have been selected for hardiness until they now produce abundant crops hundreds of miles north of their native habitat. One of the outstanding instances of such development is the case of alfalfa. This plant has proven to be admirably suited both to grazing and the production of a palatable fodder. Hardy strains have been developed and as a consequence the acreage planted to alfalfa has increased remarkably during the past five years. From a total of 305,933 acres of this crop grown in 1922 there has been an increase to 858,043 acres in 1926, almost a trebling of production. Alfalfa is now grown in every province of Canada from the Atlantic to the Pacific and from the southern boundary to the northern limit of agricultural development. Splendid stands of Grimm alfalfa were secured at Fort Vermilion, Alberta, which location is six hundred and fifty miles north of the International Boundary.

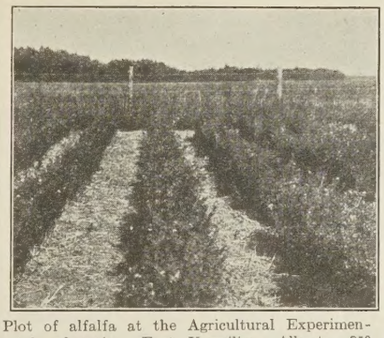
Apart from the production of alfalfa fodder to supply her own needs, Canada is now producing large quantities of the seed of this plant for export to other countries. The hardiness acquired by its development under Canadian conditions makes such seed highly desirable for planting in any country where winter-killing plays a part in crop reduction.

**Prepared under the direction of Dr. J. H. Grisdale, Deputy Minister of Agriculture, by Dr. G. P. McRostie, Dominion Agrostologist.*



The Kicking Horse Trail—View of the valley of the Kicking Horse showing how the modern automobile road, just completed, penetrates this chaos of mighty peaks, crossing from side to side to find a foothold on the canyon walls far above the rushing river. The scenery is everywhere magnificent.

The opportunities in Canada for the production of hardy forage plant seed are not limited to alfalfa alone. Canadian grown seed of red clover, sweet clover, alsike, and most of the common grasses are all valued on both home and foreign markets for the same reason that our alfalfa seed is prized.



Plot of alfalfa at the Agricultural Experimental substation, Fort Vermilion, Alberta, 350 miles north of Edmonton, showing fine growth attained at this northern point.

The successful production of the succulent forage crops is usually associated with greater difficulties than the production of the more common grasses and clovers. Even with such crops, however, Canada is making noteworthy progress. In the more humid sections of the country excellent field roots can be grown and in many sections the production of field corn and sunflower is growing apace. Particularly during recent years the production of field corn has made astonishing strides in the province of Alberta, where the area planted in 1926 was 50,000 acres, an increase of over 300 per cent over 1922. An increased area was also sown to corn in the other Prairie Provinces as follows: Saskatchewan, 33,073 acres; and Manitoba, 28,716 acres. When we consider that only a few years ago corn-growing on the Canadian prairies was not deemed possible it is indeed surprising to find that in 1926 approximately one-fifth of the total fodder corn grown in Canada was produced in this region. The successful production of both corn and sunflower is steadily but surely being extended northward.

On the whole Canada can produce all of the forage crops necessary for the successful raising of live stock of all kinds. At the same time her resources in most forage-plant seeds are being taxed to capacity, to keep pace with the increasing demand for her desirable product. In spite of the growing use of motor cars, trucks, and tractors, the demand for forage does not slacken and Canada continues to produce about fourteen million tons of hay per annum, the greater portion of which is consumed in this country.

IMPORTANT WORK PLANNED FOR NATIONAL PARKS

(Continued from page 1)

this new section lies not so much in the fact that it completes the traverse of Yoho park as because at Leanchoil it will connect with the new provincial highway, sixteen miles long, from Golden through the Kicking Horse canyon. As all who have crossed the western mountains by way of the main line of the Canadian Pacific railway will remember, one of the most spectacular portions of the route is the passage of this canyon, the narrow cleft over ten miles long through which the Kicking Horse river has cut its way to the wide valley of the Columbia. The views along this section of the highway, which clings to the side of the canyon at altitudes ranging from 500 to 800 feet, would be hard to surpass for grandeur and sustained interest.

Emerging from the Rockies the new highway runs to Golden, British Columbia. There it connects with the existing road to the south along the Columbia valley. This road may be followed to Invermere, Windermere and southern points connecting with the United States and Pacific coast; or at Firlands, 67 miles from Golden, connection may be made with the western end of the Banff-Windermere highway, returning over that road to Banff and completing the new mountain circle.

During the coming summer the attractions of Waterton Lakes park will be enhanced and brought within the reach of larger numbers of visitors by the erection of a modern hotel with accommodation for several hundred guests. The new structure will be architecturally in harmony with its beautiful setting on Waterton lake. It is planned to have a 64-room section ready for occupancy by the middle of June next. The many recreational and scenic attractions of this park, and the fact that it adjoins the United States Glacier national park at the boundary, will undoubtedly tend to attract a large number of visitors from that reservation and promote a park-to-park flow of traffic that will be of benefit to both. The completion of the Akamina highway across Waterton Lakes park, which will eventually connect with the United States Park-to-Park Highway system, also promises a future of important development to Waterton Lakes park.

In Jasper park further construction work will be done on the Jasper highway to the east and a number of local improvements made in the townsite; and in practically all the national reservations some new provisions for the comfort and convenience of tourists will be made.

SUMMER SPORTS IN WINTER ON B.C. COAST

Golf, Tennis and Aquatic Sports Enjoyed the Year Round on Southern Coast

Canada covers so vast an area and embraces such a variety of climatic conditions that it is difficult to make a general statement concerning outdoor sport which applies equally to all localities and which fits the different conditions which obtain in widely separated provinces.

With regard to winter sports, even in British Columbia the differences in climatic conditions between the lowlands and valleys of the coast and the interior districts are such that while curling, ski-jumping, hockey, skating, snow-shoeing, and other winter sports are in progress in the latter localities, on the lower mainland, especially in the vicinity of Vancouver, and on Vancouver and adjacent islands with Victoria as a centre, golf, tennis, fishing, and outdoor swimming are being enjoyed. Thus the visitor who for reasons of health or from choice is not attracted by the fascinations and charms of the truly winter sports can here find other sports which appeal to his temperament and which can be pursued among what are, to him, more congenial and equally invigorating surroundings.

Golf is pre-eminently the game which in winter appeals to the visitor from other parts of Canada or from abroad. There are many fine courses in the environs of Victoria, Vancouver, and the surrounding towns, but in addition there are tennis, salmon-fishing, and riding or motoring along the many fine roads and leisurely bridle paths which pass through most attractive and diversified scenery. Gardening, too, which in other parts of Canada generally ends in early December is here practically an all year recreation with roses and other flowers blooming on into January and February. Not to be denied the pleasures of cold-weather sports, curling, skating, and hockey are enjoyed on artificial ice in closed rinks, while badminton and other indoor games are available to the resident and visitor through the services of many well equipped clubs.

IS AMERICA GRADUALLY DRIFTING WESTWARD?

Canada Participates in World-Wide Investigation as to Movement of Continents

Is America drifting westward? Was it originally one with Europe, Africa, and Oceania? Was there at one time only one vast continent, which subsequently broke up, the component parts gradually drifting apart to eventually take up the positions they occupy today? If so is this gradual drift still continuing at a rate which can be measured? These are some of the questions which have been arousing interest in scientific circles for a number of years.

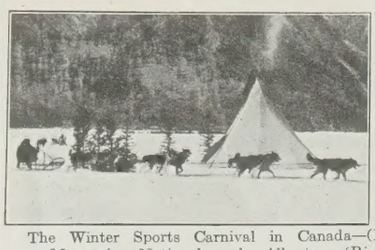
This theory, first set forth in concrete form by Wegener, an Austrian geophysicist, has, in the light of recent knowledge, many points in its favour. It is now, for example, practically an accepted fact that the basaltic substratum underlying the surface crust of the earth is not absolutely rigid and unyielding, subject only to volcanic or tectonic action, as previously believed. The present idea is that all rock is susceptible, under the action of long-continued stresses, to gradual deformation, so that the continents may be considered as to all intents and purposes floating on a substratum which, when long periods of time are considered, acts like a semi-viscous fluid. The flow of ice in glaciers is a similar phenomenon.

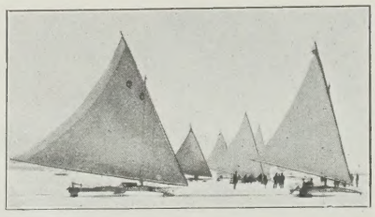
It is only necessary to examine a map, or better a terrestrial globe, to see that the outlines of America on the one hand, and Europe and Africa on the other, would fit into each other with remarkable precision by a simple displacement. There are also many geological and palaeontological evidences to show that in early times there must have been a much closer association between the forms of plant and animal life existing on these continents. Briefly the theory is that in the progress of ages the Americas have been gradually drifting westward; it is claimed that the existence of a western coast range of mountains extending throughout the whole length of these continents is simply the effect of a buckling or crushing at the forward edge due to this drift; the present rate of the drift is estimated to be of the order of one metre per year.

Partly with a view to testing this hypothesis, an international arrangement was reached by which, during October and November last, some fifty stations distributed among nearly thirty countries were united in a longitude net by astronomical observations coupled with radio time-signals. The relative longitudes of these stations having been once determined, it will be possible by a repetition of the observations at some future date to definitely settle the question of the drift of the continents.

Canada took her part in this investigation by occupying two stations, one at the Dominion Observatory, Ottawa, the other at Vancouver. At the latter place the point selected was a small field observatory which had already been occupied by the Ottawa Observatory a number of years ago for latitude and longitude observations made for purely Canadian purposes.

At each station two telescopes were in constant use, as well as the usual auxiliary equipment of clocks, chronometers, and wireless instruments. At Vancouver, since the clock equipment was not of the same permanent and concise character as was possible at Ottawa, use was made of a portable gravity pendulum, swinging entirely free and in a vacuum, to serve as a check on the clock. At Ottawa astronomical observations were obtained on thirty-three nights, and at Vancouver on twenty-five. At each place wireless time-signals from five different sending stations were received and measured at all hours of the day and night; the total number of distinct signals received was over thirteen hundred. Observations to determine the relative personal equations of the four observers engaged were made at Ottawa both before and after the main series of observations.





The Winter Sports Carnival in Canada—(Left) Dog-team racing near Banff in Rocky Mountains National park, Alberta, (Right) Ice yachts lining up for the start in a regatta on Toronto bay.

THE SPORTS CARNIVAL IN CANADA

(*Continued from page 1*)

In certain parts of Canada, particularly the hilly districts where the country is open or park-like the ski has come into great vogue and many thousands of snowshoers have become skiers. Even in these parts, however, the sport still flourishes and in the level prairie sections, on the one hand, and in the forested regions, on the other, the snowshoe is going as strong as ever.

Tobogganing as a sport has also been affected by ski-ing but not to the same extent as snowshoeing, and, in addition to the thousands of "slides" on natural hills, artificial slides have been constructed in practically every city and town to give a longer or more thrilling run than the natural declivity would provide. Snowshoeing and ski-ing are arts which have to be acquired but tobogganing can be enjoyed to the full by the novice from the moment of beginning.

No winter carnival is complete without a dog team race and since the first Dog Derby held at The Pas, Manitoba, ten years ago many other races have been organized in other parts of Canada. The Pas Derby is still the feature event of its kind and some of the most famous "mushers" in the north country compete over the 120-mile course. In point of the scenic beauty of the area through which the course lies, the dog derby held in connection with the annual winter carnival at Banff in Rocky Mountains national park in Alberta, is unexcelled. This year's race, which will be held during the week of February 5-12, will begin at Calgary and follow the motor highway to Banff a distance of 85 miles. The climax of the annual carnival in Quebec City is the International Dog Derby held on February 21-22-23. This race attracts teams from both sides of the International Boundary and provides thrills aplenty for the crowds of spectators which line the course.

A description of winter sport in Canada would be incomplete without a reference to ice yachting. Ice yachting demands such unique conditions that it is not general throughout the Dominion, but for those privileged to take it up it provides thrills second only, if second at all, to those of aeroplaning. As curling is the winter sport of the golfer, even so, but to a greater degree, ice yachting is that of the yachtsman. This is natural, because if a man does not know how to handle tiller and sails before boarding an ice yacht he will have little chance to learn in a craft the speed of which approaches, and often surpasses, a mile a minute. Some of the conditions are: large sheets of ice, free of snow and reasonably smooth, in districts where yachting is carried on during the season of open water. Wherever these conditions are found—in the Maritime Provinces, along the St. Lawrence and the Great Lakes, and on some of the smaller lakes in Eastern Canada—ice yachting is carried on. The two things which prevent ice yachting from being even more popular than summer yachting are the shortness of the season and the isolation of the different clubs. This isolation is brought about by the fact that the sport has developed on relatively small lakes or bays, inlets, and river mouths along bodies of water such as the Atlantic or the Great Lakes which are open all the year around. In consequence of this the sport is largely one for the individual, since regattas can be held only on the frozen surface of a comparatively large body of quiet water near a populous community, such as Toronto bay, Bay of Quinte and the waterways about Kingston, on lake Ontario; the lake expansion of the St. Lawrence near Montreal; or on some of the lakes or rivers in the Maritime Provinces. In itself, however, the sport is most fascinating. The yacht, thirty or forty feet in length, sweeps along with the smoothness and grace of a hawk; there is the joy of combat in racing other yachts; and if the shore of the inlet or bay parallels a railway line the exhiliration of competing with and beating fast passenger trains leaves the yachtsman nothing to desire.

Outdoor recreation in winter is not a passing fad or fashion but an ever-present necessity in this strenuous yet housed-in age, and Canada's situation and climate are such that here those sports best suited to tone up brain and body can be enjoyed to perfection. The lakes and hills, snowclad and sparkling under the bright sunlight, the crisp ozone-charged frosty air, the tang of pine and spruce, combine with the verve and swing and excitement of the sport itself to draw away the mind from carking cares, and build up a reserve of energy with which to carry on the business of life. It is the realization of these facts which turns Canadians, young and old, out to the rinks and courses and hills each winter day, as never before, and which draws increasing numbers from less favoured lands to participate in the benefit and rare enjoyment of our winter sports.

LURE OF WINTER IN MARITIME PROVINCES

Opportunities for Outdoor Recreation Many and Varied in This Part of Canada

The attractions of the Maritime Provinces as an ideal territory in which to spend a summer holiday are familiar to most Canadians and to many in other countries. Not so well known, but rapidly coming into prominence, are the advantages of Acadia (to use its former name) as a land of invigorating, health-giving winter sports. The nearness of the Maritime Provinces to Quebec and Ontario and to a thickly populated portion of the United States, and the excellence of the transportation services renders them easily accessible to visitors. Railway lines of the highest class connect them with central Canada and eastern United States, steamships operate continuously to Boston and other United States ports, while the world-famed harbours of Halifax and St. John witness the arrival and departure of ocean-going ships every day of the year. Powerful and finely equipped steamship ferries connect Prince Edward Island with the mainland.

The visitor finds it a land with an abundance of every kind of healthful winter sport into which he can throw himself with zest. As in other parts of Canada skating and hockey take first place, closely followed by ski-ing; then come tobogganing, curling, snowshoeing, sleigh-riding and ice yachting. The facilities for these sports are excellent. Skating and curling rinks, open and covered, are to be found in all the cities and towns, and on several occasions in recent years the International Amateur Skating contests have been held at St. John, participated in by skaters, not only from other provinces and the United States, but also from northern Europe. The hilly character of much of the Maritimes makes them an ideal field for ski-ing and the sport is spreading rapidly. The same conditions promote tobogganing and, where natural hills are not convenient to populous centres, artificial slides have been erected to meet the demands of devotees of this sport. Snowshoeing claims many adherents while sleigh-riding after a spanking team of horses still holds a charm for many. Ice yachting, in a land of yachtsmen where there are many lakes, broad rivers, and estuaries to provide the necessary ice-room, naturally fills a prominent place in the list of winter sports.

The Maritime Provinces, therefore, present to the visitor in search of health and enjoyment no lack either in variety or high quality of winter recreation.

The wood of the Sitka spruce which grows in the forests of British Columbia is one of the foremost materials for the construction of aircraft. This tree is highly prized in Great Britain, where it makes very satisfactory growth. The Forest Service of Canada each year furnishes the British Forestry Commission with large quantities of seed for the purpose of reforestation.

About two hundred million acres of land have been subdivided to date in Western Canada by the Topographical Survey, Department of the Interior.

NATURAL RESOURCES CANADA

Published by DEPARTMENT OF THE INTERIOR, Ottawa.

VOL. 6 MARCH, 1927 No. 3

CANADA'S FOREST RESERVES AS SUMMER RESORTS

GROWING USE OF THESE AREAS

National Forests in Western Canada Being Opened Up to the Summer Visitor

There are twelve summer resort areas in the Dominion forest reserves or national forests in the western provinces, six of which have been established in the past two years in response to urgent requests, and on these sites there are 214 summer cottages with many more in prospect. Besides this, hundreds of people go into the national forests to camp and fish for a few days and thousands more make use of them as picnic grounds for a day's outing. The rapid development of this movement has demonstrated to the people of the Prairie Provinces that there are no "Keep Out" signs on the borders of these forests, the only requirements being that visitors use them rationally, leave the areas they have occupied in a sanitary condition, and do not cause forest fires.

The name "forest reserves" now being replaced by "national forests" was in a measure an unfortunate one in that to some it gave the impression that the benefits of these areas were fenced around and reserved from the people of to-day for the use of succeeding generations. The contrary is, of course, the case. The national forests are administered so that they may be of the greatest possible use to the people of to-day and that, as the protected and managed forest overcomes the fire losses of the past, increased benefits will each year accrue to all the people until the maximum of production and use in all lines is reached.

The use of the national forests as recreational and health resorts is just as much a part of their purpose as the production of timber or the protection of stream-flow; and the satisfying feature of this work is that one use does not interfere with the other. The better the forest from a timber standpoint the better protection it gives to fish and game, the better it conserves moisture for the surrounding farming areas and the better holiday ground it is for men, women, and children. The roads which the forest engineer constructs to enable him to get fire-fighters to and through the forest quickly are avenues by which the vacationist can get to his objective; and even the forest telephone lines, erected to secure prompt news of fires, are available in cases of emergency to send news out to the home town. On

(Continued on page 2)

WESTERN CANADA'S OIL INDUSTRY

A Review of Progress Made in the Turner Valley and Other Fields in Alberta

The interest aroused by the sensational bringing in of Royalite No. 4 Well in Turner valley has recently been stimulated by the striking of similar high pressure gas containing high-grade gasolene in three other wells in the vicinity, viz: McLeod No. 2, Illinois-Alberta No. 1 and Vulcan No. 1. These wells outline roughly a triangle of which Royalite No. 4 forms the apex and the other three an irregular base, the distance of each from Royalite No. 4 being respectively 3,500 feet, 3,800 feet and 6,600 feet. The area under which the Royalite Limestone may reasonably be regarded as proven to contain workable supplies of this high-grade wet gas must considerably exceed that so outlined, but owing to the complex tectonics of the district no figures can be given which could be looked upon as other than guesswork. The three new wells each give in the region of seven to eight million cubic feet of gas a day, and a yield of 50 to 140 barrels of 72°-73° naphtha a day. Pressures are higher than it has been deemed safe to try and shut in and measure. Provision has to be made at the surface for sudden paroxysmal outbursts of gas, accompanied by frozen masses of flush water and hydrocarbons, probably accumulated in the well during the later stages of its "bringing in" and which, as in the case of the Vulcan well, completely wrecked the separator and its connections, installed for the separation of the naphtha from the gases.

Of equal interest with this extension of our knowledge of the impregnation of the Royalite Limestone is the remarkable holding up of the yield of the Royalite No. 4 well. This well began producing from the limestone at a depth of 3,740 feet on the 24th of October, 1924, when the flow of wet gas was measured at 21,500,000 cubic feet per day. Owing to the high pressure and the damaged state of the well it has not since been measured but continues to give a flow showing little sign of diminution against a back pressure of from 500 to 1,200 pounds, and the naphtha recovered averaged 430 barrels per day during 1925 and increased to 531 barrels in 1926. The cautious opinion of many that this was a "freak" well has, therefore, now been shown to be without foundation and the fact that the subsequent wells have fallen short of it is probably partly due to their having failed to reach the same horizon in the limestone.

Western Canada's Oil Industry—View of part of the Turner Valley oil-field in Alberta. To the right is seen the Royalite scrubbing plant and to the extreme left are two of the separators. In the background may be seen the derricks of the wells on adjoining properties.

A number of wells are now drilling in and around Turner valley and it is to be expected that the extent of the Royalite "pay" will before long be much further blocked out. Most operators are desirous of attaining to the limestone rather than of utilizing the upper horizons, which have in the past produced a very valuable grade of oil, 54°-57° Be., but which can be cased off and operated at a later date without detriment to these upper sources. At present only one well—McLeod No. 1—is regularly producing 20 barrels a day from the Dakota formation at a depth of 2,397 feet.

The structure that has been thus proven to have such remarkable gas and oil value in Turner valley is only one of a long series extending along the foothills of the Rocky mountains in Alberta before the formations concerned dip beneath the great Alberta syncline to emerge farther east in the great gas fields of Medicine Hat, Bow Island, Foremost, Viking and elsewhere, and which has since been shown in the vicinity of Wainwright and more recently at Bow Island to be capable of yielding oil of

(Continued on page 3)

AERIAL SURVEYS AND CANADA'S MINERAL AREAS

IMPORTANT PART TAKEN IN DEVELOPMENT

Topographical Survey and Royal Canadian Air Force Co-operate in Photographing 36,000 Square Miles

Of the many practical uses to which the aerial photograph has been adapted in Canada, one of the most important is its application to the mapping of the mineralized areas of the Dominion. Thus during the season of 1926 over 36,000 square miles of such areas were photographed. This, apart altogether from the other aerial work accomplished, constitutes a world's record for such mapping.

For years past the officers of the Topographical Survey, Department of the Interior, in common with other survey organizations, have been hampered in their endeavours to map large areas, important from a mineral standpoint because of the natural difficulties of the country and the consequent huge expenditures involved. It was only natural that, when through co-operation the facilities of the Royal Canadian Air Force were placed at the disposal of the Topographical Survey, first efforts should have been directed toward the making of aerial maps. From the very outset these efforts were successful and the development of the work has been so rapid that huge areas of hitherto totally unmapped mineralized and forested territory have been mapped with remarkable completeness.

The only air base available in 1925 for mapping areas of this kind was located at Victoria Beach on lake Winnipeg. Hence the photographic experiments were carried out within flying range of this base. The first aerial map of a mineral field to be issued was of The Pas district in northern Manitoba. This met the needs of prospectors and others interested in that territory so satisfactorily that photographs were next taken in the Rice Lake and Red Lake districts, and maps of these areas were issued in time to be placed in the hands of prospectors during the "rush" in the spring of 1926. In fact the entire issue was sold within a few weeks after printing.

The latest map of this type to be issued is known as the Carroll Lake sheet, covering the area lying immediately to the north of, and touching, the Rice Lake and Red Lake fields. This single map sheet greatly aided the prospector by adding over three thousand lakes, thousands of islands and even reefs, and nu-

(Continued on page 3)

POWER DEVELOPMENT ON WINNIPEG RIVER

By Close of 1927 Plants Will Have Installed Capacity of 250,000 Horse-power

By the close of the present year plants with a capacity of over a quarter of a million horse-power of hydro-electric energy will be installed on the Winnipeg river, Manitoba—a truly remarkable growth in twenty years. When the river is fully developed about three times this amount of power will be available, so that the city of Winnipeg and district can hope to enjoy the stimulus of low-cost power for some time to come before the market, having absorbed all the power available on this river, will have to seek further afield to increase its energy supply.

The salient features of the last three years' progress are the expansion of the application of Winnipeg River power from an almost purely urban market to large individual outside industries, the co-operation of otherwise competing interests, and finally the remarkable growth of the power market in this area.

In the fall of 1923 the Manitoba Power Company completed the first stage of its program on the Winnipeg river by opening the channel cut at Whitemud Falls and thereby lowering the tail water to the designed level at its Great Falls plant, which apart from this had been completed in its initial stages early in the year. At this time there were two other developments in operation on the Winnipeg river, that of the Winnipeg Electric Railway Company of 37,600 horse-power at Pinawa and that of the city of Winnipeg municipal system at Point du Bois where 67,900 horse-power was already installed.

The power market of Winnipeg and district is divided between the municipal system and that of the Winnipeg Electric Company and the completion of the initial development of this company's subsidiary, the Manitoba Power Company, at Great Falls brought welcome relief to the hard-pressed Pinawa plant. On the other hand, the 56,000 horse-power initial development meant a change from a shortage to a surplus of power which it was necessary to put to use. At this time the Manitoba Pulp and Paper Company was engaged in establishing a mill at Pine Falls on the Winnipeg river and the Manitoba Power Company was successful in securing a contract to supply the power requirements of the paper mill for a term of years from Great Falls. A transmission line has been built and the initial run of the mill was made on January 25 last.

In the meantime the business of the municipal station was growing; up to the end of 1922 eleven units had been installed, three more were added in 1925 and two in 1926, bringing the development to its ultimate capacity of 109,000 horse-power. Having no further generating capacity at Point du Bois and taking into account the time required to complete a new water-power development, the city of Winnipeg authorities found it necessary to take immediate steps to provide for the future requirements of the municipal system. Two courses were open, either to proceed immediately with a development at Slave Falls or to purchase some of the surplus power at Great Falls. Economic considerations were the governing factors and the city was able to defer the heavy investment that a new development would have required by contracting with the privately owned utility to supply a gradually increasing block of power for a period of eleven years. This period can be shortened to nine years at the option of the city.

Mining development in Manitoba has become active recently and the Central Manitoba Mines, Limited, having made marked progress, contracted with the Manitoba Power Company for the supply of power to the mine and a transmission line is now being built.

As a result of these contracts the Manitoba Power Company has not only secured a market for the output of its two original units but has installed a third and ordered a fourth unit for Great Falls; so that, by the end of this year, 112,000 horse-power will be installed of the 168,000 horse-power maximum capacity of this site.

Power Development on the Winnipeg River—Aerial view of the Manitoba Power Company's hydro-electric plant at Great Falls. The ultimate capacity of this site is 168,000 horse-power. —Air Board Photo.

CANADA'S FOREST RESERVES AS SUMMER RESORTS

(Continued from page 1)

the other hand the presence of citizens in the reserves in cottages or camps is a benefit to the forest, as may be readily seen. Over ninety per cent of forest fires are caused by carelessness. Carelessness is due to a lack of realization of the value of the forest, and it is safe to say that no person who has spent a week in one of our national forests fails to take away an increased knowledge of the vital part which these areas have to play in our national economy. Once the Canadian people in city and country determine that forest fires must cease, cease they will; and there is no better way to induce that determination than by showing people the forests.

Those who go into these areas to hunt or fish or have a good time swimming, boating or resting do not injure the forest if they do not start fires. Therefore, the Forest Service of the Department of the Interior has laid out summer resort sites on the shores of lakes in the reserves, where lots may be had at a nominal rental for the erection of neat cottages; has laid out camp sites; erected fireplaces; and stocked many of the lakes with fish. The Service also provides information, including maps in some cases, as to how to get about in the woods. It is customary for visitors other than those who come to the picnic grounds for a day's outing to report to the forest officer in charge. Hunting privileges are governed by the provincial game laws. It has been the discovery by the people of the prairies of the many advantages of the national forests that has led to the rapid increase in visitors in the last three years: a development which will undoubtedly benefit the whole community.

There exists a continuous line of Dominion Lands survey monuments along the water route from northern Alberta to the Arctic ocean. These monuments, established by the Topographical Survey, Department of the Interior, serve to locate the positions of mineral claims, squatters' improvements, trading posts, etc. The surveys have been the basis of a series of map sheets covering the transportation routes.

Summer Resorts in National Forests—The Prairie Provinces are not all prairie. Above is a picture of beautiful Madge lake in Duck Mountain national forest, Manitoba, an ideal spot for a summer holiday. The advantages of this resort, under the regulations of the Dominion Forest Service, are enjoyed by hundreds of visitors every season.

CANADIAN HENS ARE WORLD'S BEST LAYERS

Quality and Productiveness of Our Poultry Bring World's Congress to Ottawa

Why is Canada the best country in the world in which to raise domestic fowl of all kinds? This is the question that many thousands of people, who do not live in the Dominion, are asking themselves. They have been led to propound this query because of the magnificent display of birds made by Canada at the World's Poultry Congress in Spain in 1924, and also because of the fact that Canada holds the world's egg-production records both for a pen of ten hens and for an individual hen. As a consequence they will gather in Ottawa for the third World's Poultry Congress from July 27 to August 4, 1927.

A good many Canadians may feel that because they do not know one breed of poultry from another they have no interest in this gathering, but, if so, they miss both its national and personal significance. In Europe, particularly in Great Britain, the advancement in poultry breeding is largely due to the personal and financial assistance given by leading citizens. His Majesty King George and the Prince of Wales (both of whom will have exhibits at Ottawa) are amongst the outstanding poultry breeders in the Empire, and their example is followed by hundreds whose purpose is patriotic and philanthropic—persons who are interested in birds because they are more keenly interested in men. It is expected that the Congress in Ottawa will be attended by about seven thousand delegates from outside Canada, hundreds of whom come with the idea of seeing whether a country which produces such fine poultry would not be a good place for men and women from the overcrowded agricultural areas of Europe. The more citizens from different parts of Canada there are at the Congress the more likely the outside delegates will be to learn something of the different provinces and to take back with them an adequate conception of what the Dominion has to offer.

The Congress will include also many scientists, of international reputation in biology, genetics, pathology, zoology, etc., from all the countries of Europe. There will be a large number of British agricultural county agents, and the representatives of the great importing houses of Western Europe. These will be, so to speak, in addition to the world's great experts in all lines of poultry breeding and in the production and marketing of poultry (live and dead), eggs, equipment and supplies. There will, therefore, be very much to interest all patriotic Canadians, whatever their profession or business.

Representatives of thirty different countries will attend, and there will be one of the greatest displays of poultry ever assembled, in which it is believed Canada's part will not be insignificant. The delegates will be welcomed by His Excellency the Governor General, and by the Prime Minister. The Minister of Agriculture, the ministers of agriculture of the various provinces, and other prominent citizens are on the congress committee, which has all the details in charge.

The Congress officers are: president, Mr. Edward Brown, London, England; director, Mr. F. C. Elford, Dominion Poultry Husbandman; secretary, Mr. Ernest Rhoades, Transportation Building, Ottawa.

NATURAL RESOURCES CANADA

PUBLISHED BY
THE DEPARTMENT OF THE INTERIOR

HON. CHARLES STEWART,
Minister

W. W. CORY, C.M.G.,
Deputy Minister

Natural Resources, Canada, is published monthly for the purpose of promoting interest and supplying information respecting Canada's natural resources and their development. Applications to receive this publication and inquiries respecting any matter or document dealt with should be addressed to the Secretary, Department of the Interior, Ottawa.

Natural Resources, Canada, is published in French as well as in English.

OTTAWA, MARCH, 1927

WESTERN CANADA'S OIL INDUSTRY

(Continued from page 1)

a much heavier type than in Turner valley but which, when these areas are developed sufficiently to afford a production on an economic scale, can yield products of a very valuable nature. During the current year serious prospecting work on a hitherto unprecedented scale is anticipated and as a result it is hoped that many of these structures will be tested. In the meantime the technique of drilling and bringing in the wells under the unique conditions prevailing in Turner valley will progress with resultant economies in cost and time so that within the next year or two there is every prospect of Western Canada taking a prominent position in the world, not only in oilfield practice, but in the production of oil itself.

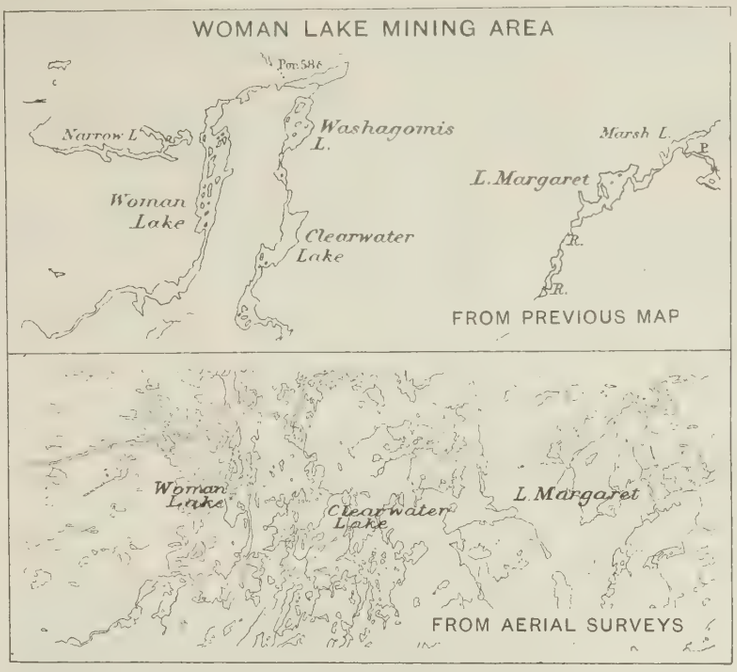
The Wainwright area may be taken as typical of the structures found east of the Alberta syncline. Like most of this region, surface geology is much obscured by glacial deposits and hence it is only where major drainage lines have enabled the very flat structures to be mapped by following the nearly horizontal exposures of shales and sands for sufficient distances, without the risk of mistaking similar lithological units at different geological horizons, that structures may be unequivocally recognized. At Wainwright the Battle river has played the necessary role in thus revealing the structure, but it need hardly be necessary to add that areas not so exposed are equally worth while testing by core drilling or geophysical methods adapted to the locality.

Beginning with the Viking gas field to the west, a series of very gentle parallel folds has been located at Hawkins, Fabyan, Wainwright and finally Ribstone, the more westerly showing large quantities of gas whilst Wainwright and Ribstone have both heavy oil and gas. The fold that has so far received most attention is that at Wainwright where an asphaltic base oil, of 20° A.P.I. gravity, has been proven to be capable of good yields from the Kootenay formation of Lower Cretaceous age, yields not hitherto made full use of, owing to the need of the establishment of production on a larger scale before the very valuable qualities of this oil can be utilized by the installation of the necessary refining equipment. During the past year a very promising structure has been proven to be similarly oil bearing at Ribstone, but the determination of the extent of closure still awaits more drilling.

The Department of the Interior, through the North West Territories and Yukon Branch, has long foreseen the developments that are now taking place, and has built up a series of regulations under which petroleum and natural gas leases under its control are administered. These regulations, which have been developed in accordance with the needs of such a widely distributed prospecting area as that which the Department is called upon to administer and with the peculiar technical conditions arising, are designed to facilitate the acquisition of petroleum and natural gas leases by all parties willing to undertake their development on lines consistent with the utilization of oil and gas with due respect to their conservation and economical handling in accordance with the best practice in foreign fields. In many ways it is fortunate that Western Canada oil and gas resources have remained practically intact and can now be worked in such a manner that due heed may be paid to the mistakes made elsewhere and that waste formerly regarded as inevitable or trivial may be avoided. It is the intention of the Department to foster and encourage the sturdy young oil industry now rapidly growing to maturity in the West, but only so long as proper attention is paid to conservation.

The fact that the flow of wet gas from Royalite No. 4 has increased rather than diminished during the two years it has continued does not imply that waste of the gas is to be ignored. It has yet to be demonstrated that the source of this wet gas is within workable depth and whether therefore the hopes that are entertained of striking a lower grade oil at greater depth are realizable, consequently the gas of the field should be treated as its main asset, particularly in view of its proximity to the Calgary market. At the same time it must be remembered that the gas is so far the only known means of transporting the valuable high-grade naphtha from its source, and conservation of the one implies consideration of the other.

Consonant with the building up of its petroleum and natural gas regulations the Department has created a staff of engineers whose function is to put into practice the ideals therein aimed at. This staff is under the direction of the North West Territories and Yukon Branch with headquarters at Calgary in charge of the Supervisory Engineer. In addition to dealing with problems arising in connection with conservation, a subject embracing a wide range of subsidiary technical branches ranging from petroleum geology to oilfield engineering, it carries out duties involving the collection of technical and economic data of all kinds associated with the prospecting and development of the fields and their correlation and conversion into statistical matter for the guidance of operators, whether on Dominion lands or not. The policy of the Department in this as in all its branches has been to encourage the most cordial relations between the members of its staff and all operators, so that conservation of these extremely valuable resources be raised to a position of primary importance and waste due to lack of coordination of effort may be eventually reduced to a minimum.



Aerial Surveys Aid Prospecting—These comparative maps of the Woman Lake mining region provide an interesting contrast between the amount of information shown by the aerial surveys map and that shown by the previous map.

AERIAL SURVEYS AND CANADA'S MINERAL AREAS

(Continued from page 1)

merous connecting waterways, to those shown on previous maps. During the season just closed photographs were taken over an area covered by four additional map sheets of this series, lying to the east and southeast of the Red Lake area and embracing the mineralized areas of Woman lake, Birch lake, and Savant lake. At the close of the past season almost 6,000 claims had been recorded in these districts, thus emphasizing the importance of the service being rendered by the aerial maps.

During the summer of 1926 for the first time planes and photographic equipment were available for use in western Quebec. These planes were dispatched to the Rouyn mining district and adjacent territory, and were successful in obtaining detailed photographs of 5,650 square miles of territory in this field. This represents the largest single detailed aerial surveys operation ever undertaken in Canada, and the photographs disclose minute details of the whole district.

The task of mapping these regions has been carried out (from the photographs taken by the Royal Canadian Air Force) by the Topographical Survey, working in close co-operation with the Geological Survey of Canada, and the survey departments of the governments of the provinces of Quebec and Ontario. The information contained in the photographs is being rapidly translated and transferred to the maps and it is expected that they will be available for the use of the prospector and the mining recorder this spring.

At Saint John, New Brunswick, the compass has changed its direction more than nine degrees since 1750.

COMBATING THE WOLVES IN NORTHERN CANADA

System Employed by Department of the Interior Effective and Economical

Wolf-killing campaigns are as old as organized society but the Department of the Interior has introduced a new element into them by endeavouring to make this ravenous beast pay for his own destruction. If wolves were easy to trap there would never be a wolf menace—the trappers would attend to that. But wolves are notoriously the most difficult of all animals to kill or capture and for this reason the trapper naturally gives his attention to furbearers more easily taken.

Canada's northern country is steadily being opened up. Possibilities in hunting, ranching, mining and other lines are coming into sight but it is a truism that these can only be developed with the aid of the native population of Indians and Eskimos. For generations the natives have depended for a great part of their food and clothing upon the caribou. The wolf preys on this animal and does further damage by destroying the fur-bearers caught in the traps of the hunters. To check these losses and to protect the subsistence of the Indians and Eskimos the Dominion Government in 1915 offered a bounty of $20 per head for each wolf killed in the Northwest Territories, the hunter being allowed after receiving the bounty to sell the pelt for what it would fetch. This brought about little, if any, increase in the number of wolves destroyed, and to get the situation into hand the North West Territories and Yukon Branch in the winter of 1922-23, and again in 1923-24, sent a wolf-hunting party into the caribou country east of Great Slave lake which resulted in the destruction in the two years of 320 wolves. The pelts thus obtained were sold at auction and the proceeds materially assisted in paying the cost of these expeditions.

In 1924, following up the success thus attained, the bounty was increased from $20 to $30 per wolf, upon condition that the pelt be surrendered to the Department. The pelts are received from the hunters at the various Royal Canadian Mounted Police posts, and shipped direct to the fur auctions in Eastern Canada to be disposed of at the various sales. This has given a great impetus to the wolf-extermination campaign and at the same time has lessened the cost per wolf to the Department; for while some of the pelts taken under the bounty scheme are only of average value the majority are prime skins of the huge timber wolf of the north, skins which are sought by dealers from all over the world. At the sales held in 1926 and the one in January, 1927, pelts to the number of 964 were disposed of for $13,861. Thus, although the hunter was encouraged, by the increased bounty of $30, to get more wolves, the Government effected a considerable saving as compared with the former bounty of $20, and the expansion of the market caused by the knowledge that such pelts can be secured in quantity will tend to further reduce the cost of combating the wolf menace.

Production of wood-pulp in Canada for the first nine months of 1926 shows an increase of almost ten per cent—732,856 tons for 1926 compared with 669,203 tons for 1925.

POSSIBILITIES OF THE MAPLE SUGAR INDUSTRY

Indicated by Improvements in Production Methods and Extention of Area of Operations

Many and varied are the benefits which forests confer on mankind, and nowhere is this more evident than in Canada. In addition to their beneficial effect on stream-flow, climate, and soil conservation, immense industries have grown up around the exploitation and utilization of their products.

Of the many forest industries of Canada, large and small, none has so deep a historical background as the making of maple sap products. Maple syrup was made by the Indians before the advent of the white man and it was from the aborigines that our earliest settlers gained their knowledge of this art. Methods of garnering the annual harvest of sap have changed greatly since those early times. The rough-hewn spouts and troughs of wood have been replaced by implements of metal, while the open kettle has given way to the modern evaporating pan with its corrugated bottom and separate compartments. In the delivery of sap to the sugar-house in the modern plants advantage is taken of the law of gravitation where conditions permit. If the maple grove is located on the side of a hill or slight elevation, as is very often the case, a temporary system of metal pipes is erected and the sap is carried by these down to the collecting tanks at the sugar-house. In this way the labour of collecting the sap is considerably reduced. At the close of the sugaring season the pipes are carefully stored in the sugar-house.

In the St. Lawrence Valley area of Ontario and Quebec and in the Maritime Provinces where the practice of sugar making is in vogue, it holds a place of prominence seldom realized in other parts of the Dominion. For many years the annual production of syrup and sugar in Canada has not varied greatly except as altered by the climatic conditions of each season which affect the "run" of sap. Measured in sugar the amount produced ranges from 15,000,000 to 25,000,000 pounds per year, with an average of about 18,000,000 pounds. The major part of the production comes from the province of Quebec where the census figures give the number of trees tapped in an average year as 4,760,000 as against 1,600,000 in Ontario, and approximately 150,000 in the Maritime Provinces. Census figures show that some 55,000 owners of woodlots in Eastern Canada are engaged in this industry, and last year's crop, according to the Dominion Bureau of Statistics, was 7,137,303 pounds of sugar and 1,746,570 gallons of syrup, with a total value of $4,896,375. Considering the total yield as sugar and using the converting factor of ten pounds of sugar to one gallon of syrup, the output of Canada's maple groves reached 24,603,003 pounds of maple sugar in 1926.

It has been pointed out by authorities on the subject that Canada is as yet making only from one-quarter to one-half of the maple sugar that might be produced in this country. In addition to the maple groves and woodlots in the more settled farming districts, there are available for future use in provincial forests in Eastern Canada vast numbers of untapped maple trees awaiting the sugar-maker; and already, under a system of permits, enterprising sugar-makers are beginning operations in the Crown forests of Quebec.

The Dominion Forest Service estimates that the total stand of sugar maple in Eastern Canada is approximately 5,860,443,000 board feet, or in round numbers, according to the usual conversion factor, about 60,000,000 trees. Canadian records show that each tree tapped yields on the average two and a half pounds of sugar annually. Calculating that at least one-third of the maple tree stand is easily available for tapping purposes, it is seen that a possible total yield of 50,000,000 pounds per year is a reasonable assumption. The other two-thirds of our maple trees may thus be regarded as a reserve for further expansion in future years.

The making of maple sugar is one of the minor forest operations, yet the fact that it fits in well with other farm work, by occupying a slack season and by bringing in the first crop-money of the year, commends it to farmers in suitable districts, while the steadily increasing demand for pure maple sugar, the improvements and the reduction of costs in production methods, and the movement under way to extend the area of operations all point to the possibilities of the industry.

SCENIC WEALTH OF JASPER PARK

Largest of Canadian National Parks Rapidly Gaining in Popularity—New Areas Being Opened Up

Within the past three or four years travel to Jasper national park has practically doubled. This is in part due to the provision of a modern and delightful hotel together with a golf links that is one of the finest in Canada and also in a measure to the growing knowledge, on the part of the public, of the many wonders and outstanding attractions this vast reserve contains. All that the park has to offer, no one, not even he most familiar with this great region, fully knows. Jasper park is so vast that it would take a man several years to cover all the trails that are open and it includes whole sections as yet practically unexplored. Each year new areas are penetrated and further knowledge added to that already obtained and each successive discovery has added to the conception, not only of the riches of this great playground, but of the grandeur and majesty of the Canadian Rockies themselves.

Since the important exploratory work done by the Topographical Surveys Branch, Department of the Interior, in the course of its definition of the boundary between Alberta and British Columbia a few years ago, interest has centred largely on the rich region in the southern and western sections of the park. The maps and reports issued in this connection reveal that the great Columbia ice field extends within the southern boundaries of Jasper park and that the noblest peak of the region—mount Columbia, a beautiful snow-covered pyramid, second only to mount Robson in elevation in the entire Rockies—is not as had been supposed, considerably south of the boundary but actually forms part of it. It is here, in this vast ice sea, lifted on the shoulders of more than a score of mighty peaks, that the true culmination of the Canadian mountains is found, and it is a region of such grandeur and beauty that those who have seen it can scarcely find words adequate to express their wonder and admiration. It can be reached from Jasper in from three to four days by horseback and, as the trails are gradually improved, must become one of the great objectives for foreign and other visitors.

In Jasper National Park—Although the camera has not caught the magical colourings and reflections of famed lac Beauvert, some idea of the beautiful setting of Jasper Park Lodge may be gained from this view. The picture was taken looking northeastward across the lake toward Colin range and Old Man mountain.

Another region, richer in historic if not scenic interest, is what is known as the Whirlpool sector in the southwestern part of the park. The route lies up the Whirlpool valley and follows the old Athabaska trail used by Hudson's Bay Company brigades between Vancouver and York Factory in the early days of the fur traders. A difficult and arduous undertaking in those days was the crossing of the Athabaska pass and many accounts left by early travellers relate the hardships and dangers encountered. As the Divide is approached the scenery increases in grandeur. The two famous peaks, mount Brown and mount Hooker, long believed to be the highest summits of the Rockies, which have been the objectives of several fruitless expeditions, guard the two sides of the pass. Sweeping around to the southeast is a region rich in alpine scenery of the most majestic kind. Scott glacier is pronounced by everyone who has seen it to be one of the most spectacular in the Rockies, and the whole upper valley of the Whirlpool is declared to be in the same class as the already famous Tonquin valley.

To meet the steadily increasing demand for accommodation the Canadian National Railways will this year again enlarge Jasper Park Lodge. The new plans will provide accommodation for 600 guests and will include additional conveniences—a new ballroom, a refreshment-room, and an extension to the rotunda, etc. Further extensions will also probably be made this year to the system of small over-night shelters provided along the outlying trails and these will make it possible for increased numbers to view such magnificent scenic regions as Maligne lake and Shovel pass.

DOMINION SURVEYORS SUPPORT DEVELOPMENT

Spirit of Optimism Concerning Canada's Future Pervades Twentieth Annual Meeting

The twentieth annual meeting of the Dominion Land Surveyors' Association held in Ottawa, 2nd and 3rd of February, was significant for the spirit of reasoned optimism displayed in regard to the development of Canada's resources in the next few years. There were over seventy of these "pathfinders" present from nearly all the provinces and conditions in all parts of the Dominion were under review. The members were welcomed and given a word of encouragement and advice by Hon. Charles Stewart, Minister of the Interior. Mr. F. D. Henderson of Ottawa, the retiring president, gave the keynote to the gathering by showing that Canada was destined to advance very rapidly in the next few years and urging all surveyors to support the movement to develop agriculture, mining, water-powers and other resources. The addresses which followed stressed the use of the most modern instruments and methods—the radio, the aeroplane, the making of maps from aerial photographs, and the like. Reference was also made to the immense strides in recent years in hydro-electric development and mining.

The chief officers elected were: president, Mr. R. W. Cautley, Edmonton, Alberta; vice-presidents, Mr. E. C. Brown, Winnipeg, Manitoba; Mr. J. W. Pierce, and Mr. W. H. Norrish, Ottawa, Ontario; secretary, Mr. W. L. MacIlquham, Ottawa.

As part of the campaign for the elimination of man-caused fires, the Forest Service of Canada maintains a small corps of lecturers in the summer-vacation camps for boys and for girls. During the past summer (1926) these representatives visited twenty-four camps, and reached a total of 1,600 "'teen-aged" girls and boys in this way. The lecturers instruct the campers in tree identification, the need for forest conservation, and kindred topics.

In Canada there are about 150 species of plants that reach tree size. Of these thirty-one are conifers (or softwoods).

NATURAL RESOURCES CANADA

Published by DEPARTMENT OF THE INTERIOR, Ottawa.

VOL. 6 APRIL, 1927 No. 4

APRIL 24 TO 30 SET ASIDE AS "CANADIAN FOREST WEEK"

CANADA'S FOREST FIRE LOSSES DURING 1926

Conditions Moderate in the East but Fire Hazard High Throughout the West

The forest fire situation in Canada during 1926 was again a very serious one. There were marked contrasts in fire hazard conditions between the East and the West and consequently wide differences in the total fire losses in the two parts of the Dominion. In Eastern Canada both the spring and fall were cool and rainy so that new low records for forest fire losses were established. A midsummer period of fire hazard occurred in the East generally but it passed without any great damage being done. In Western Canada, 1926 closely followed the two previous years, both in the intensity of the hazard and in the fire losses. Danger conditions continued, generally, throughout the season and the scant precipitation afforded little relief from early spring to late fall.

According to figures prepared in the Forest Service of the Department of the Interior, there were 5,529 forest fires in Canada last year which burned over a total area of 1,824,015 acres. The total gross damage and loss is estimated at $7,468,343. The following table gives the figures for the year in detail as compared with the averages for the five-year period, 1922-26:—

	1926	Average 5 years 1922-1926
Total number of fires	5,529	6,203
Total area burned (acres).	1,824,015	3,024,207
Merchantable timber		
Area burned (acres).	574,716	742,772
Timber burned M.B.F.	2,347,614	4,105,690
Estimated stumpage value...	$ 4,208,456	$ 9,743,070
Young growth		
Area burned (acres)..	624,801	891,254
Estimated value.. ..	$ 1,244 266	$ 2,834,517
Cut-over		
Area burned (acres).	239.334	500,944
Estimated value..	$ 181.000	$ 533,730
Non-forested		
Area burned (acres)...	477,159	961,967
Other property burned (value)..	$ 967,335	$ 1,013,447
Actual cost of fire-fighting..	$ 866,286	$ 782,131
Total gross damage and loss..	$ 7,468,343	*$14,214,646

*This high average is due to the exceptional losses in 1923, when the total losses were over $40,000,000. The average for the last three years was $6,531,077.

Maritime Provinces—In Nova Scotia and New Brunswick conditions during the 1926 season were very similar. The spring was wet and late in both provinces and the fire hazard was low until July. Conditions continued threatening until the latter part of August when

(Continued on page 2)

EXTRACT FROM THE PROCLAMATION ISSUED BY HIS EXCELLENCY THE GOVERNOR GENERAL

Whereas the following facts relative to our forest resources are of great importance to the Canadian people:

(*a*) THE FOREST, next to agriculture is the greatest source of national income.

(*b*) THE FOREST can with care and proper handling contribute permanently to the welfare of the nation as well as to the health and happiness of our citizens.

(*c*) THE FOREST supplies not only the raw materials for our industries, but also, in the form of the woodlot, provides fuel and other useful products for the farmer.

(*d*) THE FOREST, planted on sand areas, stops the invasion of good farm lands by blowsand and at the same time reclaims to the service of man waste areas now serving no useful purpose.

(*e*) THE FOREST, planted as shelter-belts on the open prairie, protects stock, makes fruit-growing possible, and beautifies the home.

(*f*) THE FOREST conserves the water in lakes and rivers thereby protecting the fish and game and ensuring constant stream flow, so necessary in water-power development.

(*g*) THE FOREST is the greatest single attraction to the tourists who visit our country.

(*h*) THE FOREST is the main source of supply of softwood timber within the Empire and should be protected by every possible means.

And whereas the existence of Canada's forest resource is threatened by two great dangers, both of which are man-caused and therefore preventable, namely:

(1) Almost universal carelessness with fire in the forest resulting in the destruction, not only of timber and young growth, but of the very soil which produces it.

(2) The use of wasteful and destructive cutting methods without any thought of ensuring a new crop.

Now know ye that we, by and with the advice of our Privy Council for Canada have thought fit to appoint and do appoint the week commencing Sunday, the twenty-fourth day of April, and ending on Saturday, the thirtieth day of April, in this present year, as *"Canadian Forest Week"* which, being also the beginning of another season of travel and recreation in the forest with attendant fire danger, is an appropriate time for the citizens of our Dominion to renew their attention for another year to the situation as hereinbefore set out, and to give careful heed to information issued by the several Forest Authorities and Agencies in Canada to the end that all may be encouraged to a sustained effort in promoting the conservation of this valuable resource, and especially that

(1) Woodlot conservation, waste land reclamation, and shelter-belt planting will be more efficiently carried on.

(2) Woods operations will be so conducted as to provide the best conditions for regrowth of valuable species of timber.

(3) Proper precautions against fire in the forest will be demanded of all, and carelessness or neglect will involve the fixing of responsibility on the individual and the application of the penalties provided by law.

Of all which our loving subjects and all others whom these presents may concern are hereby required to take notice and to govern themselves accordingly.

IMPROVED METHODS OF FOREST PROTECTION

Rapid Advances Made in Canada in Development of This Important Work

Because "out of sight is out of mind" the average dweller in town and country in Canada is not yet aware that the advance in fire-fighting methods in the past decade has been even greater in our forests than in our cities. True the cities have their electric alarms, motor equipment, and aerial ladders but the different forest services and protective associations, which ten years ago were largely restricted to foot and canoe patrols and a few hundred miles of telephone line, now have scores of lookout stations, thousands of miles of telephone wire, and make use of the radio and the aeroplane.

The great advance that has been made in forest fire fighting in the past few years has been the separation of fire-detection from fire-suppression. Formerly there could be scarcely any division of labour. Rangers were assigned to long beats, which might take a fortnight to cover, and patrolled these singly or by twos, as circumstances dictated. It will thus be seen how limited would be the protection so afforded. Also, when the patrol discovered a fire too large for one man or two men to handle, it might take a week before headquarters could be communicated with and a force of men brought to the scene.

Contrast those methods with plans followed in the best equipped forests to-day. These forests fall into two classes: (1) those where fires are detected from lookout stations and, (2) those where detection is accomplished by the aeroplane patrol. In the first class a number of lookout stations are located on mountain tops or in high towers, and all stations have telephone connection with the forest headquarters. During the danger season a lookout man, equipped with fire-finder and map of the forest, is constantly on duty. When a fire is sighted he at once telephones headquarters giving its location. Through the forest run roads and trails, cut by the rangers in the slack season, so that, upon receipt of an alarm, headquarters is able to send at once, by motor truck or on horseback, a party to fight the fire.

In the forests covered by hydro-aircraft patrol, roads and trails are often infrequent or lacking, but myriad lakes

(Continued on page 3)

STEADY PROGRESS IN HISTORIC SITES WORK

Eighteen Sites in Maritime Provinces Marked by Department of the Interior

The marking of historic sites which are deemed to be of national importance by the Historic Sites and Monuments Board of Canada, and which are recommended by that body to the Department of the Interior, for action, is going forward steadily. This work along with that of restoration and preservation is being carried on by the Canadian National Parks Branch. Eighteen sites of this nature have already been dealt with in the Maritime Provinces.

Where possible a suitably engraved bronze tablet is affixed to a wall or pillar of the building with which the event to be commemorated is associated. In the case of a site of a destroyed building or of a battlefield the tablet is placed on a standard in the form of a large boulder or a cairn constructed of rubble stone conveniently located for the visiting public. The sites referred to above are situated as follows:—

NOVA SCOTIA

Louisbourg, Cape Breton, ruins of old French fort erected 1720.

Fort Cumberland, near Amherst, formerly old French Fort Beausejour erected in the middle of the seventeenth century.

Fort Edward, at Windsor, erected 1750 on the site of old French Fort Piziquid.

Fort Anne, Annapolis Royal, one of the most notable sites in North America, dating back to 1604.

Fort Lawrence near Amherst, erected in 1750.

Champlain's Habitation, Lower Granville, site of building erected 1605.

Halifax, tablet on the wall of the Province House commemorating the setting up of the first printing press in Canada, March 23, 1752.

Halifax, tablet in the dockyard marking the site of the first dockyard in Canada, 1751.

Shelburne, tablet on a large boulder to recall the founding of this United Empire Loyalist town of Nova Scotia, 1783.

PRINCE EDWARD ISLAND

Charlottetown, tablet on a pillar at the entrance to the Provincial Building to commemorate events of outstanding importance associated with the history of Prince Edward Island.

NEW BRUNSWICK

Fort Meductic near Woodstock, chief stronghold of the Maliseet Indians in Acadia in 17th and 18th centuries.

St. John, tablet in market square to commemorate the landing of the United Empire Loyalists 1783.

Fort Charnisay, St. John, erected 1645.

Fort La Tour, St. John, erected 1631.

Campbellton, tablet to commemorate the last naval battle in North American waters in the Seven Years War, Restigouche river, 1760.

Fort Monckton, near Port Elgin, formerly old Fort Gaspereaux, erected by the French, 1750.

Fort Nashwaak, Devon, erected 1692.

Bathurst, tablet to commemorate the public services of Nicolas Denys, appointed Governor and Lieutenant-General of the Coasts and Islands of the Gulf of St. Lawrence, 1654.

Canada produced in 1925 nearly thirty per cent of the newsprint paper made in the world.

In Buffalo National Park, Alberta—The end of a duel between two male mule deer. Their antlers became entangled, holding them firmly, and the wardens had to rope them before they could be released.

CANADA'S FOREST FIRE LOSSES DURING 1926

(Continued from page 1)

heavy rains relieved the situation. In Nova Scotia a total of 177 fires was reported but these burned only 442 acres of merchantable timber, 249 acres of young growth, and 222 acres of slash, causing an estimated loss of $2,579. The total area burned over was 3,181 acres of which 14 per cent carried mature timber. A total of 65 fires occurred in New Brunswick, burning over 12,347 acres. About 93 per cent of this area carried merchantable timber in which the losses aggregated 6,426,000 board feet valued at $25,786.

Quebec and Ontario—In Quebec and Ontario, the fire losses were the lowest on record. The dreaded spring fire season passed without serious loss and the provincial and other fire protective agencies in these two provinces were able to deal successfully with the dangerous midsummer period. Ontario reported the total number of fires in 1926 as 1,110 and the total area fireswept as 88,374 acres. Although the number of fires was only slightly below that of 1925 the area burned over was less than half of the previous year's figure of 187,496 acres. Of the 1926 area 12,734 acres carried mature timber, but perhaps the greatest loss was the 28,886 acres of valuable young growth. The remaining area comprised 22,244 acres of cut-over land and 24,510 acres of non-forested land.

Prairie Provinces—In some ways the Prairie Provinces—Manitoba, Saskatchewan, and Alberta—experienced the worst season in recent years both in point of the intensity of the fire hazard and in the losses suffered. In Manitoba the month of May was as usual a period of extreme fire hazard during which occurred 208 of the 463 forest fires reported for the season. There was a respite during June and July followed by six weeks of hot, dry weather and high winds which accounted for 107 of the season's fires. The 1926 total was 303 greater than that for 1925. The area fireswept is placed at 55,000 acres of which 60 per cent was non-forested land. About 8,182 acres of merchantable timber was lost and 13,500 acres of young growth destroyed. The Royal Canadian Air Force co-operated in aerial detection and suppression and, in the area covered, very satisfactory results were obtained. In Saskatchewan the fire season of 1926 was the most destructive experienced since 1919. It was also exceptional in that the fires continued at frequent intervals throughout the summer instead of being concentrated in the two u ually well-marked seasons, spring and fall. The numbers of lightning and incendiary fires were large, but settlers' fires caused the greatest loss. Of the 221 fires reported, 121 were in or bordering on forest reserves but only 2 per cent of the total damage occurred on the reserves. Due to the comparative inaccessibility of many of the northern fires, 70 per cent of the season's fires exceeded 10 acres in size; the aggregate area of all fires reached about 550,000 acres. Three-fifths of this area carried merchantable timber, chiefly spruce, jack pine, and poplar; one-fifth was young growth; and the remainder was non-forested. Thirteen million feet of saw-timber was burned and over 2,000,000 cords of pulpwood, entailing a loss in excess of $1,000,000. The fire season in Alberta was a long one and was characterized by marked extremes. Three distinct seasons of great fire hazard were experienced, resulting in a total of 279 fires, 26 of which occurred on Dominion forest reserves. Of the total 116 or 42 per cent were detected and extinguished in the incipient stage, and 90 additional, or 32 per cent, were suppressed before they covered 10 acres. The total area burned over was 207,000 acres, of which 37,000 acres carried merchantable timber and 100,000 acres bore young growth. The total estimated damage is placed at $752,000.

British Columbia—Abnormal weather conditions created a situation of great fire hazard in British Columbia. The unusually light snow-fall of the winter of 1925-26 left the timber areas dry in April and very little rainfall occurred during the succeeding six months of the fire season. On the Dominion lands in the Railway Belt the season was the most disastrous yet experienced, 469 fires occurring. Sixty-five per cent of these were put out before they reached 10 acres in size and the total area fireswept was 198,995 acres as compared with 148,170 acres in 1925. On provincial lands 2,147 fires were reported as against 2,521 in the previous year; the main losses were met with in the difficult southern interior region. Lightning caused 25 per cent of the fires. The total burned-over area was about two-thirds of that in 1925, but the losses involved were severe. Five hundred million feet board measure of merchantable timber was damaged or destroyed, and an area of 200,000 acres of young growth fireswept. The loss of property other than timber, such as camp equipment and buildings, reached a value of $750,000, and the total loss sustained, including the cost of suppression, on both Dominion and provincial lands, was $2,903,393.

Historic Sites in the Maritime Provinces—Unveiling of a cairn bearing a bronze tablet to mark the position of the King's Bastion, Fort Louisbourg, Nova Scotia.

WARDEN FINDS DEER LOCKED IN COMBAT

Animals With Antlers Entangled Freed by Officers of Buffalo National Park

In Canada, the big game country of the continent, the finding in the woods of skeletons of two male deer with antlers firmly locked together is a comparatively frequent occurrence. These remains are taken to indicate that the bucks became locked in combat and that when thus rendered helpless death came quickly in the shape of wolves or by exhaustion. Rarely, however, have woodsmen come upon deer so entangled, and probably the first occasion upon which the combatants have been freed occurred a short time ago in one of the game sanctuaries of the Canadian National Parks, Department of the Interior.

In this instance the officer in charge of the cattalo enclosure at the Buffalo national park at Wainwright, Alberta, where the mule deer are numerous, noticed two bucks locked together by their antlers and unable to get free, in spite of desperate struggles. Being alone he was not able to deal with the situation, but next morning with three others to assist him the combatants were roped and separated unharmed.

WATER-POWER SITUATION IN CANADA

The water-power situation in Canada to-day is one of a record development per capita of total population, of increasing construction work, and of large development in view for many years to come. The continuous statistics compiled by the Dominion Water Power and Reclamation Service of the Department of the Interior show that during the past 10 years the developed water-power has increased at an annual average rate of nearly 6¾ per cent—this however includes the war period when many projects were in abeyance. During 1924 the increase was over 12 per cent and during 1925 over 20 per cent.

NATURAL RESOURCES CANADA

PUBLISHED BY

THE DEPARTMENT OF THE INTERIOR

HON. CHARLES STEWART,
Minister

W. W. CORY, C.M.G.,
Deputy Minister

Natural Resources, Canada, is published monthly for the purpose of promoting interest and supplying information respecting Canada's natural resources and their development. Applications to receive this publication and inquiries respecting any matter or document dealt with should be addressed to

The Secretary,
Department of the Interior,
Ottawa.

Natural Resources, Canada, is published in French as well as in English.

OTTAWA, APRIL, 1927

HOW GEODETIC BASE LINES ARE MEASURED

Survey Engineers Exercise Great Care to Secure Maximum Degree of Accuracy

The unit of measurement used by the Geodetic Survey of Canada, Department of the Interior, is the metre. The metre was originally defined as that distance represented by one ten-millionth part of the quadrant of the earth's circle passing through Paris, France. In practice it is necessary to furnish a concrete example of a metre with which measuring apparatus such as rules, tapes, chains, etc., may be compared. The metre bar used as standard by the Geodetic Survey of Canada is of nickel and is termed a Standard Nickel Metre Bar. The length between two fine lines cut in the metal is the specified metre.

To measure the exact distance between two points on the surface of the earth is one of the most delicate operations in the field of engineering. It is quite impossible to take the metre rule and determine directly and accurately a distance of several miles. In order to make such a measurement a tape 50 metres long is generally used, the length of the tape having been previously determined from that of the standard metre bar by a series of very careful operations. A tape for use in measuring distances on a precise survey must have its length determined to within one-thousandth of an inch in 165 feet, or about one inch in 32 miles. Tapes used for primary work are made of invar—an alloy of nickel and steel which has the peculiar property that changes in temperature give rise to only slight changes in length.

The accuracy with which the measuring tapes or chains of the surveyor are checked has been illustrated, but unless the tape is applied with the same care to the actual measurement of the land line it is obvious that all the original time and effort expended are lost, and the final result is untrustworthy.

Suppose that it is desired to measure a primary line on the earth (base line, as it is called). The engineer who plans the survey selects the site of the base in some locality where the two ends of the base are intervisible, and where the intervening ground is fairly level. The first operation of the base line engineer is to mark the position of the line by pickets. This is done by placing a surveyor's transit at one end and pointing the telescope on a signal erected at the other end, and then having linemen place the pickets in line from end to end of the base. It is next necessary to remove all trees, weeds or tall grass, so that no obstacle will come in contact with the tape when measuring. The tape is supported at the ends and centre by posts, one at every twenty-five metres.

For convenience in measuring, and to guard against or detect error, the base line is divided into sections of twenty 50-metre lengths or one kilometre each. Each kilometre section is measured four times (forward and backward with two tapes). To obtain the necessary degree of accuracy the tape is operated under a uniform tension supplied by terminal weights acting over frictionless pulleys. The tape is supported at its centre by a frictionless race or pulley, the top of which is so adjusted that it is in line with copper plates on the fifty-metre posts. Thermometers attached to the tape give the temperature at the time of observing. If this differs from the standard temperature the corresponding length is deduced by applying a small correction. While one trained observer keeps the end of the tape at the rear post exactly in line with the mark on the copper plate, the other observer at the forward post simultaneously makes a mark on the plate of his post to indicate the tape length, after the adjustment of the tape has been made twice to check the marking carefully. This process is repeated until the first kilometre is measured. The observers now change ends, transfer thermometers, and work back to the initial post, checking the former measurements thoroughly. This entire process has to be repeated immediately with another tape.

Lines on the surface of the earth can be measured so that in a distance of 8 miles there would be an error of only one-quarter to one half of an inch. This accuracy is necessary in base line measurements since it is from these that all errors of length of the survey are corrected.

This is magnificent!—but it is war. Such fires, although they may occur hundreds of miles from our larger industrial centres, cannot be dismissed by the average citizen as of only passing interest for forest fires have a far reaching effect on production, commerce, and transportation and they deliver a blow which shocks the whole economic fabric.

IMPROVED METHODS OF FOREST PROTECTION

(Continued from page 1)

provide landing places. The detection planes which make regular patrols are fitted with radio apparatus. When a fire is detected the message as to its location is sent back to the base. Here a larger plane, called the suppression plane, is kept in readiness, and upon receipt of the report this is flown to the scene of the fire with a number of fire-fighters and their equipment.

In addition to the advance in fire-fighting methods the equipment has also been much improved of recent years and includes gasolene-operated pumps which, though light enough to be carried on a man's back, have yet sufficient capacity to pump water through more than half a mile of hose.

In the national forests the aeroplane work is carried on by co-operation between the Royal Canadian Air Force and the Dominion Forest Service. In provincial forests other arrangements are in force, but, wherever introduced, a giant step forward has been made by the use of the aeroplane. It might be thought that with such progress little would remain to be done as regards forest fire protection in Canada, but what is urgently needed is that these methods which now apply to only a small part of our forests be extended until all are covered. This need is causing prominent citizens in all walks of life to give earnest support to the various forest authorities in their fire-protection efforts.

DO NOT BURN MARSHES IN SPRING

Considerable damage is done to wild life by the burning of marshes in spring according to a warning issued by the Commissioner of Canadian National Parks. When marshes are burned in spring the cover that might shelter the nests of waterfowl and form a protection for young birds is destroyed. Trappers report that muskrats are often found singed when the marshes in which they live have been burned. The natural cover afforded by marsh growth in spring is valuable to wild life, and this cannot be destroyed without causing serious consequences.

RAPID DEVELOPMENT IN ROUYN DISTRICT*

1926 An Eventful Year in Western Quebec Field—Pushing Prospecting Work

The year 1926 has been an eventful one in the Rouyn district. The desire of the investing public to participate in the success which this field offers has been met by the incorporation of a large number of companies whose objects are the development of prospects that appear promising. A large amount of money has thus been provided for the expensive work of development. A great deal of stripping and diamond drilling has been done and in some cases underground work has been undertaken. Every effort is being made to uncover valuable deposits where any indication of their presence can be found. There is an inclination on the part of mining people to make use of all possible technical methods, a decision forced in part by the extensive drift cover, but one that indicates a growing confidence in technical advice. A new departure is the widespread use of electrical and magnetic methods of prospecting for orebodies, followed by diamond drilling to evaluate mineralized bodies thus indicated. Interest throughout the Rouyn camp is now centred on the discovery of heavy sulphide ores, and gold bearing quartz veins have become a secondary consideration. It is also to be noted that in most cases any extensive work in the way of development has been preceded by careful geological work.

Areas along the Canadian National railway have also offered a great deal of encouragement to mine operators. North of lake Abitibi, sulphide deposits have been uncovered and work has been undertaken to prove their value. Whether or not they prove of economic importance, they are at least indications that this area is worthy of careful prospecting.

In the upper basin of the Harricanaw river, gold-quartz deposits have been under investigation for several years. On some of these properties high grade gold ore is known to be present, but large tonnages are yet to be shown. Molybdenite is known to be present in considerable quantities in this general locality. These deposits are within the Keewatin lavas associated with fairly acid intrusives. In Bourlamaque and Louvicourt townships where large intrusives cut the greenstones, some chalcopyrite has been observed and there are areas that merit careful investigation as potential copper-bearing localities.

Gold-quartz deposits occur in Bousquet, Cadillac and Malartic townships and already considerable work has been performed on them. They appear to be of a type that persists in a long zone extending westward to the Rouyn district proper. In Fournier township some very promising gold-quartz deposits have already received preliminary work. This area is now benefiting from the increase of capital devoted to mining in Quebec and it is to be expected that during the coming year a further large amount of capital will be introduced into these areas outside the Rouyn area proper.

**Prepared at the direction of Dr. Charles Camsell, Deputy Minister of Mines, Canada, by Dr. W. F. Jones, of the Geological Survey, Ottawa.*

INDIANS INCREASE IN PRAIRIE PROVINCES*

Residents of Reserves also Advance in Matters of Health and Education

The Indian population of the Prairie Provinces of Canada continued to increase during the last year according to the Department of Indian Affairs. Recent computations show that the number of Indians on reserves is 31,304, distributed as follows: Manitoba, 11,775; Saskatchewan, 10,466; Alberta, 9,063. During the year there were 1,182 births on these reserves and 814 deaths, a natural increase in population of 368. The addition to the above figures of the numbers of Indians in the bands in the far northern parts of the Prairie Provinces, some of which are not yet under treaty, brings the total estimated Indian population of the Prairie Provinces to nearly 35,000.

The continued increase of these wards of the Government is interesting evidence that in Canada at least the Indians are no longer a "vanishing race". Successes in grain growing and cattle raising have been outstanding features of the progress of the Indians in recent years. Their advancement and growing prosperity have brought about a much improved mode of living and there is every prospect that the Indians will eventually be entirely self-supporting.

In the matter of medical attention, the development of a new attitude on the part of the Indians has been very gratifying, and is noticeable in many ways. Greater care is being taken of the children by parents as a result of instructions and demonstrations given by medical officers, travelling nurses, and field matrons. At the reserve hospitals the Indians seem increasingly anxious to avail themselves of surgical treatment when advised by the medical officers, and appear to have lost their fear of hospitals and operations. The cottage hospitals built on some of the reserves are much appreciated and on several reserves where there were no hospitals the Indians have voted to use part of their band funds toward such institutions.

Encouraging conditions are also found in the Indian schools and workers report that very few children of school age are not in attendance. The importance of this educational work is evident from the fact that about 50 per cent of the farming Indians are graduates of boarding schools. Exhibits sent by the pupils to the annual exhibitions at Regina, Calgary, and Edmonton received favourable attention and showed in a very striking way the extent of the training given the Indian girls and boys. At present there are 41 residential schools in the three Prairie Provinces. Two new residential schools to replace two old structures have been erected on the Peigan reserve in Alberta to accommodate 120 pupils. Modern equipment has been installed in all the schools of recent construction to render as efficient as possible the work of the teachers in preparing Indian youths to take their places in the life of the Canadian West.

**Prepared under the direction of Dr. Duncan C. Scott, Deputy Superintendent General of Indian Affairs, by Mr. W. M. Graham, Indian Commissioner, Regina, Saskatchewan.*

CANADIAN FOREST WEEK CAMPAIGN

Work of Organization Outlined—Facts Showing Vital Importance of Forests to Canada

"Industries dependent on products of the forest are of the utmost importance in our national life. They are second only to agriculture in the national wealth they produce. From the standpoint of the public credit, their export trade especially in pulp and paper, renders invaluable aid in maintaining a favourable rate of exchange with foreign countries. From the standpoint of the people, they, of all industries, return to the workers in the form of wages, perhaps, the largest proportion of the cost of production. It follows that the destruction of the raw materials for these industries threatens directly the future means of livelihood of an important part of our population."—Hon. Charles Stewart, Minister of the Interior.

Aerial view of a forest fire taken last season. Some idea of the advantages of the use of the aeroplane in detecting and suppressing fires in our forests may be gained from this picture. The fire-fighters, summoned by radio message from the detecting plane, are rushed to the scene in a larger aircraft. Before they land the warden in charge is able to locate the nearest water supply, note the direction of the wind, and generally lay out his plans for attacking the fire.

The announcement that the period April 24-30 has been selected as Canadian Forest Week has brought to a focus the labours of those citizens throughout the Dominion who, actuated by patriotic motives, are endeavouring to impress upon their fellow countrymen what the forests mean to Canada and what must be done if they are not to be swept away but are to be perpetuated and their productivity increased.

The work of organizing the campaign for the observance of Canadian Forest Week has been in progress since early in the year. While all of Canada is being covered attention is particularly directed to the communities in or near forested districts where the greater part of forest fires originate. Speakers are being provided by local bureaux for organizations and clubs which desire addresses on the subject. For the schools there has been prepared and distributed through the co-operation of provincial committees a special program of exercises to be carried out by the children under the supervision of the teacher during the week. As in past years the newspapers, realizing the dangers of forest destruction, are taking a leading part.

Since exploitation of our forest resources began, from four to five times the amount of timber actually used has been burned through forest fires.

Weather forecasting has been adapted to forest fire protection in Canada with sufficient success to indicate that it will shortly be a prime essential in protective work. It is hoped that the burning of settlers slash and similar forest operations may be governed by fire weather forecasting methods.

By protection and proper management the accessible forest land of Canada could be made to produce in perpetuity several times the present annual cut. It will, at best, take many years to bring about this adjustment. On the other hand, if present methods and losses continue the annual cut will have to be reduced.

Wood products enter into the manufacture of commodities which touch every phase of human existence and fifty per cent of Canada's manufacturing industries depend on wood as a raw material. The capital invested in our forest industries is $666,000,000—one-third in lumbering plants, saw-mills, etc., and practically all the remainder in the pulp and paper industry.

The forests of Canada rank second only to agriculture in the value of their products; they are the source of one quarter of our export trade; they provide 20 per cent of the entire freight haulage on Canadian railways and in addition substantially augment passenger traffic earnings by the attraction of tourists; they provide direct employment for over 97,000 workers and furnish salaries and wages to the total of over $100,000,000 per year.

Canada is the principal source of softwood supplies in the British Empire. Only by curtailing losses and increasing productivity can she hope to discharge faithfully her responsibilities in this direction; she must conserve her forest wealth and bring about a more healthy relationship between depletion and annual growth.

ASTRONOMERS SEEKING NEW SOURCE OF ENERGY

Interesting Phase of Work of Dominion Astrophysical Observatory

Mankind in this industrial age is dependent in a large degree upon the mineral resources of coal and oil, which represent the energy of the sun stored up over millions of years. That these resources are finite and are comparatively rapidly reaching a point where they can no longer be economically mined, is universally admitted. Accordingly the problem of finding new sources of energy may be regarded as the most important and urgent which faces modern applied science, and it is interesting to note the bearing upon this of astrophysical researches such as are carried on in the Dominion Astrophysical Observatory at Victoria, British Columbia.

The ultimate solution of this problem is one which will be reached if at all, by the road of astrophysics. From investigations of the past history of our sun, in the light of studies on other stars, it has become evident that the source of energy of all these suns is sub-atomic. As the sun grows older it loses mass, and for each pound of itself, which is annihilated by the union of a hydrogen nucleus and a free electron, there is set free as much energy as would be liberated by burning over a million tons of the best anthracite coal. If this energy, however, were set free only in the far interior of the sun, where the temperature is measured in millions of degrees, there would not be much hope of either obtaining or controlling this very powerful source of sub-atomic energy. Fortunately, however, recent astrophysical investigations indicate that some at least of this energy is released near the surface of the sun at comparatively low temperatures. It is then no chimerical dream to anticipate the use of this fundamental source of energy upon the earth, perhaps almost in the lifetime of some now living. When this take place mankind will, thanks to purely astrophysical investigations, enter upon a new industrial era, in which we will be independent of our rapidly disappearing mineral fuels.

A striking feature in the development of national forests in Canada has been their use as recreational areas. The public have eagerly grasped the possibilities for holidaying and recreation which are afforded. On a number of national forests in the four western provinces summer resorts have been laid out in which citizens have erected cottages. Provision has also been made for campers, especially in the way of preparing suitable camp sites along motor highways which pass through the forest.

The planting of shelter-belts around farms on the Canadian prairies has given appreciable results from the agricultural standpoint. The water-conserving power of the soil has been increased; better crops have resulted; and the protection from extremes of temperature and wind movement has enabled the introduction of the hardier fruits in many localities. Of particular importance is the additional moisture secured through the formation of snowdrifts which melt gradually in the spring, providing water after adjoining open areas have largely dried up.

NATURAL RESOURCES CANADA

Published by DEPARTMENT OF THE INTERIOR, Ottawa

VOL. 6 MAY, 1927 No. 5

STRIKING RECORD SET BY PULP AND PAPER INDUSTRY

CANADA LEADS WORLD IN NEWSPRINT PRODUCTION

Growth of Industry One of the Outstanding Features of Our National Progress

That Canada has, within a relatively short space of time, taken her place among the wealthier nations of the world is the result of her good fortune in the possession of vast natural resources and the enterprise and energy of her people in developing them.

The pulp and paper industry has been one of the prime factors in the achievement and in this direction Canada made the most surprising record in her history during the year just closed. For the first time she definitely took the lead of the nations of the world in the production of newsprint. The production of this commodity in the Dominion for 1926 has been estimated at 1,881,737 tons and on this basis exceeded, by 24 per cent, the figure for 1925. Canadian production also exceeded that of the United States (previously in the lead) by about 195,000 tons of newsprint. During the year, seventeen new newsprint units were put into operation; of these thirteen were installed in Quebec, one in Ontario, two in British Columbia, and one in Manitoba. In the latter province the timber is administered by the Department of the Interior, and the contract entered into between the operating company and the Government constitutes the most modern pulpwood sale on the continent, aiming, as it does, at a perpetual supply of pulpwood for the mill, by application of rational, rather than exhaustive, methods of forest management.

Canada's newsprint mills started the present year (1927) with a rated capacity of 7,350 tons per day as compared with 5,700 tons per day in 1926, in which year they produced over one third of the world's newsprint. If present plans are realized the capacity will be increased a further 1,200 tons in 1927.

In spite of the great expansion in newsprint production, the markets in the United States, Great Britain, Australia, and other countries have been able to absorb the increase and the Canadian mills have been able to operate close to capacity. It may be pointed out that most of the pulp and paper mills in Canada are of modern construction and their proximity to pulpwood supplies and power places them in an advantageous position.

(Continued on page 2)

CANADA'S NATIONAL PARKS IN CENTRAL ROCKIES

New Developments in Waterton Lakes, Rocky Mountains, and Yoho Parks of Unusual Interest to Tourists

The year's program of developments in connection with Canada's National parks contains three items of unusual interest to tourists. The first is the opening of the new motor highway from Lake Louise to Golden; the second the building of an exceptionally attractive tourist hotel in Waterton Lakes park; the third, the inauguration of a through auto bus service between the United States Glacier park in Montana, and Waterton Lakes, Calgary, Banff, Lake Louise, and Field. All of these developments will make possible a much wider and more democratic use of the national parks. With the construction by the Government of modern highways through the parks giving direct connections from both the east and the west and the provision of motor campsites, rest camps, and inexpensive bungalow hotels, a new era in the use of these beautiful national possessions began. Last year over 100,000 motorists alone visited the mountain parks which are accessible by highway, or more than came a few years ago to all the parks by rail.

The opening of the new Lake Louise-Golden highway, which is to be known as The Kicking Horse Trail, is being awaited with the keenest anticipation by the motorist. Not only will it add another national playground, Yoho park, to those already within his reach and give access to Field, Emerald lake and the famous Yoho valley, but it will enable him to cross the main Rockies by the well-known Kicking Horse pass, paralleling the route now followed by the main line of the Canadian Pacific railway. To many, the culminating feature of the new road will no doubt be the last ten miles in which it passes through the spectacular canyon of the Kicking Horse, undoubtedly one of the most picturesque trips in the whole journey across the Canadian mountains. The fact, too, that from Golden he may travel southward by way of the existing provincial road through the Columbia valley to Firlands, British Columbia, and thence return via the famous Banff-Windermere highway to the east, completing a loop of nearly 300 miles entirely within the Rockies, or from Firlands continue south to Fernie, British Columbia and thence return eastward by way of the Crowsnest pass to Waterton Lakes park and Macleod, makes this new highway section perhaps the most important yet constructed in the mountains.

Canada's National Parks in the Central Rockies—Looking along the entrance road toward the townsite of Waterton lake in Waterton Lakes National park, Alberta.

(Continued on page 4)

MOTOR TOURISTS WILL THRONG CANADA THIS YEAR

EACH PROVINCE HAS ITS SPECIAL ATTRACTIONS

Good Roads and Ideal Climate Increase Pleasure of Pilgrims to City and Wilderness

There is no doubt that the coming months of 1927 will be the greatest season for motor touring, as regards both citizens and visitors, that Canada has yet known. Many causes are contributing to this result, the two chief being the spread of the information at home and abroad that our main highways are not surpassed by any on the continent, and the realization by our neighbors to the south that Canada has an ideal climate, so that in summer they may escape from the heat, the congested highways, and the familiar fields to the comparative coolness, the uncrowded ways, and the new and striking scenes in city, country, and virgin wilderness in the Dominion.

The other causes of this increased interest in touring in Canada are so numerous and spring from so many different sources in every province as to defy the attempt to catalogue them, but perhaps the most important, so far as visitors are concerned, is the change in Dominion Customs Regulations which extends the time United States motor tourists may remain in Canada, without the deposit of cash or bonds, from thirty days to ninety days. The various provinces are more actively engaged than ever before in improving motoring conditions. Most of them have bureaux to deal with the subject, and tourists entering a province, either from another province or from outside of Canada, will find that they are able to obtain hunting and fishing privileges by applying to the provincial game officers, and complying with the game laws.

On the physical side the changes in the motor touring situation in the past thirty-six months have been enormous. This year shows a great advance over 1926, and those who have not been over the roads in any one of our provinces for three years will find a practically new situation. Though there is as yet no transcontinental motor road on Canadian soil the highway system in every province has been extended and improved until, with the building of a few links, the chain will stretch from Atlantic to Pacific. These modern roads have brought more traffic with the result that facilities have kept pace with the

(Continued on page 4)

DISCOVER TRUE SOURCE OF THE DUBAWNT RIVER

Officers of Topographical Survey Correct 150-Year Old Error in Hearne's Map

One of the most interesting of the early explorations across northern Canada was that made in 1771-2 by Samuel Hearne, who travelled from Fort Churchill on Hudson bay to the Arctic ocean at the mouth of the Coppermine, and returned by a more southerly route through Great Slave lake. He accompanied a band of Indians in their most erratic wanderings and, though without instruments, he kept a record of his courses, and on his return he produced a map. This was accepted a few years later and was incorporated in Captain Cook's map of the world. It has since been reproduced on all maps of Canada.

From time to time, during the course of more recent explorations into northern Canada, features of Hearne's map have been identified and adjustments made. One of his pivotal points, passed on both the outgoing and return journeys, was called *Thelew aza Yeth* or Little Fish Hill lake. It lies in the country north of lake Athabaska, and *Thelew aza* river which drains it has been accepted on all maps since that of Captain Cook as the source of Thelon river. Exploratory surveys made into this region during 1926 by Mr. G. H. Blanchet, D.L.S. of the Topographical Survey, Department of the Interior, led to the rediscovery of Hearne's *Thelew aza,* determined its true course, and corrected a geographical error of 150 years standing by proving it to be the headwaters of Dubawnt instead of Thelon river. By this exploration several hundred miles were taken from the length of Thelon river and 150 miles of new water added to the Dubawnt, and the Taltson-Tazin River system was extended by the discovery of a new tributary draining the country to the northeast of Tazin lake. This is the *Edza zeth Thelcho* or "Skin of an Animal" river of the Indians and is now called Abitau river.

The journey entailed about 800 miles of canoe travel. Eighty-six rapids were encountered and the portaging amounted to about 75 miles allowing for the repeated trips at each carrying place. The general route followed as far as the Arctic-Hudson Bay divide was suggested by reference to several Indian maps. Athabaska lake was left by a portage route from Black bay to Tazin lake and Abitau river was ascended to its source on a great dome-shaped area which here forms the Arctic-Hudson Bay height of land. The parting of the waters on this flat-topped divide is intensely interesting. Slight accidents of topography turn the small streams this way and that and many such rivulets, uniting, produce streams which fall away down the slopes on each side with ever increasing volume.

The divide was crossed by following a number of small lakes and ponds where the streams were too small for the canoe. Finally, as the Hudson Bay slope was descended, a river large enough for canoe navigation was reached to the northeast and this was later found to correspond to Hearne's *Thelew aza.* The country here falls in long gentle slopes with only a few scattered hills breaking its regularity. Short, rapid stretches of river alternate with lakes of great irregularity through which it was difficult to find a course. The poplar and jack pine were left behind and the forests changed to small ragged black spruce with birch occasionally at the rapids. Finally the forests disappeared and the country assumed the pleasant open character of the northern plains. One hundred miles down the course of the *Thelew aza* river the locality was reached in which it had been supposed the river turned northerly to join the Thelon. Instead, it swung more easterly, then south and finally entered known Dubawnt waters at Wholdaia lake by a great northwest bay.

Signs of both recent and old Indian travel were frequently seen in the trip up Abitau river to the height of land but in the descent of *Thelew aza* river the only evidences of human life were very old—the rotting remains of birch-bark canoes, places to which the Indians had resorted for "birch rinds," and "quarries" where stone arrowheads were made.

The return journey from Wholdaia lake was made through northern Saskatchewan by way of the Lake Selwyn-Lake Athabaska route.

Discover True Source of the Dubawnt River—Map showing the headwater country of the Taltson, Thelon, and Dubawnt rivers. The heavy lines indicate additions made by recent discoveries while the lightly dotted lines show where it was previously supposed these lakes and rivers were located.

STRIKING RECORD SET BY PULP AND PAPER INDUSTRY

(*Continued from page 1*)

Along with the record output and export of newsprint, was an increased export of wood pulp (groundwood, sulphite and sulphate). The official production figures for 1926 are not yet available but the increased export figures are indicative of increased production and a greater demand for Canadian pulp in foreign markets. The production of book and wrapping papers is on a more even keel since the products meet more particularly the demand of the home market, but even here the exports show increases in most cases. The following table gives the exports of the industry for the years 1925 and 1926:—

Pulp		1926	1925
Mechanical	(tons)	382,077	360,205
	(value)	$11,505,818	$10 573 273
Sulphite bleached	(tons)	200,995	185,890
	(value)	15,734,220	14,049,500
Sulphite unbleached	(tons)	254,576	263 854
	(value)	14,393,546	14,150,271
Sulphate	(tons)	165,433	149,722
	(value)	10,443,538	9,158,861
Total weights	(tons)	1,003,081	959,671
Total values		$52,077,122	$47,931,905

Paper		1926	1925
Newsprint	(tons)	1,731,986	1,501 655
	(value)	$114,089,595	$ 98,945,337
Wrapping	(tons)	18,522	20,535
	(value)	2,259,663	2,779,298
Book	(cwt.)	60,545	47,765
	(value)	520,337	434,693
Writing	(cwt.)	19,044	12,371
	(value)	143,806	102,039
Paperboard	(tons)	.....	.....
	(value)	4,401,112	4,362,679
Total values		$121,414,513	$106,624,046

In the manufacture of artificial silk (rayon) from wood pulp Canada is progressing rapidly, and Canadian mills now supply, it is said, 50 per cent of the world's requirements of bleached sulphite for this purpose. It is expected that in the near future, several large plants for the manufacture of rayon will be established in Canada.

The pulp and paper industry in this country is represented by a capital investment of over five hundred million dollars; it gives direct employment to over 28,000 workers—to whom about $39,000,000 per year is paid in wages and salaries—in the mills alone, disregarding those engaged in woods operations; and in 1926 the exports, valued at $173,491,635, represented 17 per cent of the total export trade.

These facts, strong though they be, are still further emphasized if the industry is regarded from the angle of value added to the raw material in the process of manufacture, or the net value of production. This net value of production is admitted to be one of the best indications of the national value of a manufacturing industry and in the case of pulp and paper the net value is 60 per cent of the gross value, and very much greater, in proportion, than in any other important manufacturing industry in Canada.

The following table gives the proportions for the seven leading manufacturing industries:—

	Percentage Cost of Raw Materials	Percentage Value added by Manufacture
Pulp and Paper	40	60
Saw Milling	59	41
Cotton Spinning, etc.	61	39
Automobiles	67	33
Butter and Cheese	78	22
Meat Packing, etc.	81	19
Flour Milling, etc.	87	13

TOURIST TRAVEL TO YUKON TERRITORY

Steamers and Railway Carry Thousands of Visitors—Striking Scenery—Big Game

A striking feature of Canadian progress in the last ten years has been the development of tourist travel to and through Yukon territory. This is not to be wondered at considering, on the one hand, how much there is to be seen and enjoyed on such a trip and on the other, that routes which in the famous gold rush of 1898 were conquered only by Herculean labours and at the risk of life and limb, can now be traversed with comfort and amid luxurious surroundings. White pass, lake LaBarge, Thirty Mile river, White Horse rapids, Miles canyon, Five Finger rapids and other once terrible places, where so many men came to grief in the old days, or conquered as by miracle, may now be viewed from a railway train or from the deck chair of a powerful well-appointed steamer. The tourist traffic into Yukon territory is now such that all through the season at least one steamer per day lands its passengers at Skagway—the coast terminus of the White Pass and Yukon railway. Most of these steamers, which are models of steadiness and comfort, belong to the two Canadian transcontinental railways. From Skagway the tourists go over this railway line to Burnett, Carcross and White Horse and from these places take steamer for Taku Arm and Atlin, famous districts in British Columbia, or go on to Dawson (Yukon) and Nenana (Alaska).

In 1926 over seven thousand tourists visited these places of whom over one thousand went down the Yukon to Dawson. These numbers are exclusive of the big game hunters who go north in the autumn and who outfit at Whitehorse for the hunting grounds which from that point are reached by launch, motor car or pack train. The thrilling scenery of the mountains with the deep canyons, rushing rivers, and snowcapped peaks and the grandeur of the Yukon river, the great highway to the Klondyke and this land of the midnight sun, are the chief attractions of the route. Another lure of the trip is the opportunity to see placer mining by hydraulic and dredging methods conducted on a scale not exceeded anywhere. The tourist is enabled to get a close view of operations by taking a short run out from Dawson by automobile.

A feature that has tended to increase the popularity of these routes, resorts and hunting grounds is that, by means of wire and wireless, tourists can keep in almost constant touch with their homes and offices in any part of the continent, while at the same time enjoying all the advantages and the health-giving freedom of this great northern playground. All transportation agencies supply particulars about tours, and information regarding hunting trips may be obtained from the Gold Commissioner at Dawson or the Territorial Agent, Whitehorse, Yukon.

In the year 1925 there were in Canada eighty establishments manufacturing wood-pulp and sixty-nine manufacturing paper. Some of these made both products. Forty-five manufactured pulp only, 34 paper only, and the remaining 35 made both pulp and paper.

NATURAL RESOURCES CANADA

PUBLISHED BY

THE DEPARTMENT OF THE INTERIOR

HON. CHARLES STEWART,
Minister

W. W. CORY, C.M.G.,
Deputy Minister

Natural Resources, Canada, is published monthly for the purpose of promoting interest and supplying information respecting Canada's natural resources and their development. Applications to receive this publication and inquiries respecting any matter or document dealt with should be addressed to

The Secretary,
Department of the Interior,
Ottawa.

Natural Resources, Canada, is published in French as well as in English.

OTTAWA, MAY, 1927

TO ASSIST MINES AND EASE FUEL SITUATION*

Dual Purpose of Legislation to Subsidize Coking Plants in Central Provinces of Canada

Since the forecast of legislation in aid of the coking industry, in the Speech from the Throne last December, a considerable number of Canadians have been looking forward to the introduction of the measure. Although legislation of this nature had been under consideration by the Government for some time, the suggestion contained in the report of the Duncan Commission, relating to the erection of coking plants, was a verification of needed assistance to the coal mining industry of Nova Scotia.

The Honourable Charles Stewart, Minister of Mines, in introducing a bill that would provide a subsidy applicable to the erection of by-product coking plants that would use Canadian coal, presented a measure having the dual purpose of assisting the Canadian coal mining industry and at the same time relieving the fuel situation in the acute fuel areas of Central Canada. The bill was passed by the House of Commons, and received third reading by the Senate on the 8th April.

The terms of the subsidy provide an annual payment over a period of fifteen years, of four per cent of the cost of the plant in the case of a private corporation; and five per cent of the cost in the case of municipal ownership. It was recognized that a blending of coals is necessary in order to produce the best grades of domestic coke, and to assure the production of such a fuel, provision is made for an admixture with American coal up to 30 per cent. As a means of stimulating the use of Canadian coal, and protecting the investment, a sliding scale has been arranged whereby the use of 70 per cent of Canadian coal entitles the manufacturer to the full subsidy but if less than 50 per cent is used no subsidy is paid.

While this legislation is of particular interest to Nova Scotia, its benefits are not entirely confined to that province. The main object of the bill is to encourage the erection of by-product coking plants which it is hoped will materially supplant the use of anthracite coal in Central Canada with coke manufactured from Canadian coals. Investigations by the Dominion Fuel Board have demonstrated that one of the main avenues of escape from dependence on the anthracite fields of the United States lies in the development of the use of coke for domestic heating. Incidentally great improvements have been made in the technique of the manufacture of coke in recent years. The output of the by-product ovens is now a superior type of fuel—quite equal to anthracite for domestic purposes.

As a contribution to the industrial strength of the country, any impetus to the replacement of imported coal by coke from coal mined in Canada will undoubtedly be reflected in augmented prosperity to the coal mining industry in Nova Scotia. A problem there has been to give winter employment to the miners. As coal for coking can be mined in the winter and banked for shipment during the summer months, this must tend to alleviation of winter unemployment by allowing a more equalized production over the year.

All Canadians are interested in measures that portend an industrial improvement in our coal mining areas. Central Canada householders are particularly interested in stabilizing the domestic fuel supply. The legislation brought down by the Minister of Mines is evolved from a study of economic and scientific problems connected with our fuel situation and appears to be a constructive measure in the foundation of a national fuel policy.

** Prepared under the direction of Dr. Charles Camsell, chairman of the Dominion Fuel Board, Ottawa.*

Reseeding the Upper Waters of the Fraser River—Shipment of 15,000,000 sockeye eggs on a scow at Lakelse lake, British Columbia.

DOMINION OBSERVATORY GIVES US THE TIME

By Observations of Sun and Stars Canadian Astronomers Keep Our Clocks Right

How do the engineers in Canadian factories know when to blow the noon whistle? The answer is, of course, that they are dependent upon the factory clocks, which are regulated by local clockmakers and horologists, who in turn get the time directly or indirectly from an observatory, the principal one in Canada being the Dominion Observatory at Ottawa.

The great grandfathers of the present generation who lived in Lower and Upper Canada and the Maritime Provinces knew in the summer that it was time to break off work in the "back clearing" and go home to dinner when their shadows on the ground had grown so short that a man or boy could readily step on the shadow of his head. These astronomers in embryo could with experience, come within twenty minutes or half an hour of the right time; their successors demand much more exactitude, but those who tell the time are still dependent upon the rotation of the earth and the positions of the sun and stars. The work of distributing to the public the results of observations of this nature is called time service, and in Canada is one of the special functions of the Dominion Observatory.

In using the rotation of the earth as a timepiece the observer's telescope serves exactly as the hand of a clock to point to the figures on the dial. The stars and the sun correspond to the numbers on the dial and the time is read off when the telescope points to one of these figures. The results of years of observing and computing by astronomers have made it possible to tell what time the ordinary clocks should show when any particular star passes the telescope. Any ordinary surveyor's telescope, a watch, and a star catalogue are sufficient to get the time to half a second. For very accurate time a larger telescope on a firm pier is used, and many accessories are required for noting the time and comparing it with the clock.

For carrying the time on from one series of observations to the next, the Dominion Observatory has three primary clocks, each kept under constant temperature, and two of them have airtight cases and so are not affected by changes of barometer.

For general household use, time correct to a minute is accurate enough, for most other services an accuracy of a second is sufficient: but for scientific purposes, for example in astronomy in making star catalogues; in seismology, to locate the place and time of earthquakes; in surveying, to establish the positions of points on the surface of the earth; time is often required correct to the one hundredth of a second.

The electric current plays an increasingly important part in all time services. It carries the time from the telescope and records it on a strip of paper; automatically keeps the clocks wound; and by means of it the master clock keeps a series of secondary clocks at exactly the same time, and runs a number of electric dials. The telegraph, telephone, and wireless distribute the time to the public. Many electric generators are kept in step with master clocks, in which case it is possible to run special clocks in residences by plugging into any electric light socket.

However, whether the clock is set by other clocks in public buildings, by the time gun, factory whistles, or radio broadcasting station—in short, from whatever source the time is derived—it has come from the rotation of the earth as read on the stars by an astronomer with a telescope.

SHIP FIFTEEN MILLION SOCKEYE SALMON EGGS

Largest Single Shipment Ever Made in Canada Sent to Upper Fraser River, B.C.

The largest single consignment of salmon eggs ever shipped in Canada was that made by officers of the Fish Culture Service of the Department of Marine and Fisheries to the upper waters of the Fraser river in British Columbia. Fifteen million sockeye eggs, in the "eyed" stage, were transferred in specially constructed crates from the Dominion Government's fish hatchery at Pemberton on the Fraser river below Hell's Gate canyon to the following spawning grounds in the Upper Fraser: Stuart lake, Francois lake, Bowron lake, and the Quesnel lakes.

In the transportation of eyed eggs and young fry from the hatchery below Hell's Gate canyon to what at one time were most productive spawning grounds of the Fraser river system, the Fish Culture Service is performing an important work. Previous to 1913 the upper waters of the Fraser were visited annually by great numbers of spawning sockeye. Available records for over 100 years show that one year in every four brought exceptionally large runs. In 1913 a big run occurred but owing to a rock slide in Hell's Gate canyon very few of the salmon reached the spawning grounds. Notwithstanding the fact that the debris from the slide was removed as soon as possible the damage was evident in the barrenness of these Upper Fraser areas during succeeding "cycle" years.

For sixteen years the runs remained small and it was not until artificial planting had been resorted to that any appreciable improvement was noticed in the situation. Because no sockeye were getting above Hell's Gate canyon, the hatchery at Stuart lake was closed for a number of years. In 1920 it was reopened and an experimental distribution of eggs and fry was made the next year. At the end of the four-year cycle one of the best runs in years was reported.

Last year the big shipment of 15,000,000 sockeye eggs was made to the upper waters of the Fraser and it is confidently hoped that a continuation of these methods will result in firmly reestablishing the Upper Fraser as a great sockeye spawning area.

The north boundary of Alberta is that part of the sixtieth parallel of latitude between longitude 110° and longitude 120° west of Greenwich. A portion of this boundary extending westerly from Slave river to Little Buffalo river, a distance of thirty-six miles, was surveyed and marked on the ground by the Topographical Survey, Department of the Interior, during the summer of 1925.

CANOEING ONE OF OUR GREAT SUMMER SPORTS

Ideal Conditions for Its Enjoyment Throughout Canada—A Typical Trip

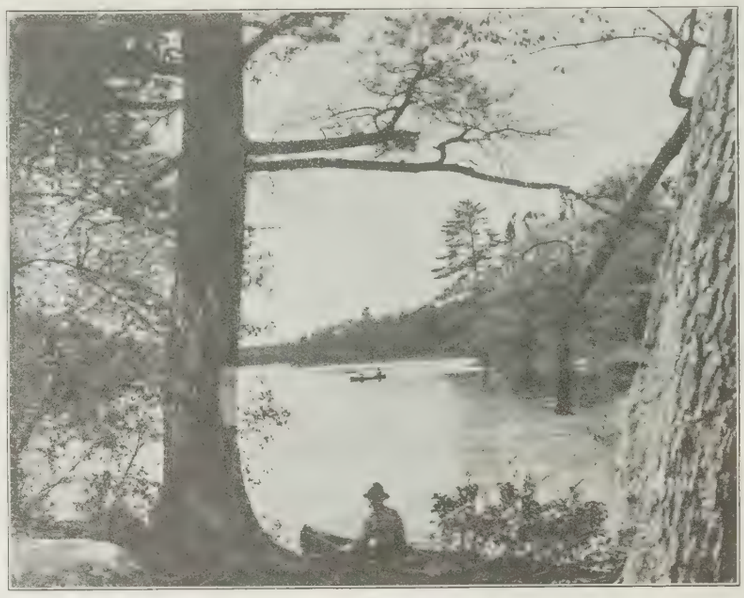
Men competent to speak on the subject declare that the canoe has provided a distinctive note in Canadian literature from the time of Champlain to the present day. Its mention appears in the chansons of the voyageurs and it is the theme of many of our modern poets. Nor is this to be wondered at, since Canada is of all the world pre-eminently the land of the canoe. The natives of other new countries had canoes for inland waterways but for the most part they were clumsy inefficient affairs which disappeared before the superior water craft of the white man. Not so the birch-bark canoe of the Indian tribes who dwelt in Canada. Their craft was adopted by the white explorers and traders, and to-day, now that new materials are available, canoes made in Canada, which are the best in the world, are modelled on the lines of the redman's birch-bark, and are each so light as to be readily carried by one man and so seaworthy as to outride storms on our great inland freshwater seas and even on Hudson bay itself.

Never country had such a canoe and never canoeist had such a country as Canada. At hundreds of railway stations and steamboat landings the canoeist can drop his craft into the water and in an hour have penetrated so far into the wilderness that apparently no sound more modern than the bellow of the moose or the cry of the loon has ever broken its primeval stillness. Alarm clocks and telephones and suburban trains are forgotten, time is measured by meals and sleeps; for what an appetite even a dyspeptic has on a canoe trip and how the victim of city sleeplessness enjoys that blissful slumber on a "couch of new-pulled hemlock" in the wilderness.

And Canada invites her own children and those of other countries to take these canoe trips. All she asks is that tourists keep the game laws and do not burn down the forests. Canada needs the forests in her business—they constitute a very important part of her business—and then, no visitor would desire to come back the next year to find a blistered and blackened brûlé. There are hundreds of canoe routes in all parts of Canada and for the convenience of intending voyagers the Department of the Interior has prepared maps and detailed directions for a large number of these in all the provinces.

The following is a short description of a typical round canoe trip in the Maritime Provinces. The trip traverses the beautiful network of lakes in Annapolis and Queen's counties, Nova Scotia—some of them, like Rossignol and Kejimkujik, are far famed for their virgin beauty—the scenery is wild and delightful and the route offers a direct challenge to the adventurous pioneer spirit. The round trip, which covers 107 miles should preferably be taken early in the year as the rivers are then more easily navigable. The country abounds in game, including moose, deer, and bear; and trout are plentiful along the entire route.

The detraining point is Shannon River Bridge, a point on the Bridgewater and Port Wade branch of the Canadian National railway. At the station the canoe is dropped into the waters of the Shannon river, which are followed south to Shannon lake. A short portage leads to McGill lake which is crossed to its southwest corner. By following a small stream the first, second, and third Molly Upsim lakes are crossed in succession. Another portage leads to Kolly lake and a third short portage to Alma lake (about 9 miles from the starting point) on the islands of which several guides' camps are located. From the southwest corner of Alma lake the route turns south to the Medway river through Medway, Dean, and Eel lakes, and bends southeastwardly to the large Ponhook lake, 34 miles from the detraining point. A direct westerly course is now followed and a way is threaded through the extensive network of lakes between Ponhook lake and beautiful Rossignol lake, only three short portages, of less than half a mile each, being necessary. From here the Liverpool river is followed northwardly to Kejimkujik lake, where good accommodation can be obtained. The route leaves the lake, continuing along the Liverpool river, and follows a northeasterly course to Harry lake, then by the East Branch river to First East Branch and Frog lakes, with a one-and-a-half-mile portage; then by Bear lake and another half mile portage to George's lake, and on to Henry lake, from the east side of which another short portage leads to the West Branch Medway river which is followed southeastwardly to its confluence with East Branch Medway river. From this point the outward trip is retraced to Shannon River Bridge completing a round trip of 107 miles.



Canoeing in the Maritime Provinces—View of beautiful Kejimkujik lake in southwestern Nova Scotia, where good fishing awaits the sportsman. Scenes like this are frequently met with along canoe routes in the Maritimes.

CANADA'S NATIONAL PARKS IN CENTRAL ROCKIES

(*Continued from page 1*)

With the building of a completely equipped and modern hotel at Waterton Lakes park, this charming reservation will at last take its rightful place among the most attractive of Canada's national playgrounds. As is well known this park lies contiguous to the United States Glacier park. Geography has virtually made them one playground and the building of a hotel in Canada by the Great Northern Railway Company—an organization which has done much to develop Glacier park—and the establishment of regular boat and bus services between the two reserves, must result in greatly increasing the travel to the Waterton Lakes park.

MOTOR TOURISTS WILL THRONG CANADA THIS YEAR

(*Continued from page 1*)

need. Mechanics who can make all necessary repairs are located at intervals along every highway, and good accommodation at reasonable prices is available for touring parties. Whether the tourist prefers the palatial hotels of the cities and fashionable summer resorts or the more modest hostelries and tourist lodges, or desires to test the pleasures of tenting on tourist camp sites he will find facilities to meet his need.

The number of gatherings in Canada this year will make for increased motor travel in all parts. In every city and town the sixtieth anniversary of Confederation will be marked by fitting celebrations and to these and to a number of important conventions such as the Worlds Poultry Congress in Ottawa there will be personally conducted automobile tours from other provinces and from the International Boundary. In connection with the Poultry Congress there will be ten such tours starting at different points ranging from St. Stephen, New Brunswick and Digby, Nova Scotia in the east to Sault Ste. Marie, in the west. In the Prairie Provinces and British Columbia many gatherings will be attended by motorists, while the openings of scenic highways to and through national parks and the completion of connecting links in the Rocky mountains and on the Pacific coast will mean that from sea to sea there will not be a portion of Canada that will not witness greater motor tourist activity than ever before.

The inauguration of a through bus service from Waterton to Banff, thence to Lake Louise and Field, will not only facilitate travel between Waterton Lakes, Rocky Mountains, and Yoho parks but also with the United States Glacier park. In the United States there exists already a highly developed system of highways which touches all the main national parks in the western States, and connecting bus lines make it possible for visitors to travel easily from one to the other. The new transportation facilities in connection with the Canadian parks will no doubt cause many tourists to extend their trips into Canada and to enjoy the wonders of the Canadian Rockies in the open-air, open-sky way.

"BEOTHIC" WILL MAKE ANNUAL ARCTIC PATROL

1927 Expedition Will Visit Present Posts and Cruise Westward to Heart of Archipelago

The establishment of a new post on the southern end of Baffin island and a reconnaissance survey in the very heart of the Canadian Arctic archipelago will be carried out during the annual patrol of the Dominion's northern island possessions this summer. Preparation for the 1927 expedition are being pushed forward by the North West Territories and Yukon Branch of the Department of the Interior and, in addition to the new work outlined above, the posts already established will be re-provisioned and the necessary relief changes made in the police personnel.

The S.S. *Beothic,* which made last year's patrol, has again been chartered and will sail with the expedition from North Sydney, Nova Scotia, about July 15. Besides the usual quota of supplies for the posts already established, building materials, supplies, and other equipment will be taken north for the new post to be erected at Lake Harbour on the southern coast of Baffin island. The first point of call on the northward journey will be the Danish port of Godhavn, North Greenland. Pond Inlet, on Baffin island will be the first of the Canadian posts visited, after which the expedition will go to Dundas Harbour, Devon island; Craig Harbour, Ellesmere island; Etah, North Greenland; Rice Strait and Bache Peninsula, Ellesmere island, in the order named.

Leaving Bache Peninsula the ship will begin the southward journey, touching at Dundas Harbour before the projected cruise up Lancaster sound, Barrow strait, and Melville sound is begun. Ice and harbour conditions along these waters will be investigated with a view to establishing a post, at a later date, on Bathurst island, Cornwallis island, or Melville island. The *Beothic* will return to Pond Inlet, later visiting Clyde River, Pangnirtung, and Lake Harbour also on Baffin island. The expedition will remain at Lake Harbour long enough to see the new post established after which the homeward voyage will be continued to Port Burwell, northern Quebec, and North Sydney.

Mr. G. P. Mackenzie, of the North West Territories and Yukon Branch will, as in the past two years, be in charge of the expedition and the other members will include Inspector C. E. Wilcox, of the Royal Canadian Mounted Police and nine relief constables; Dr. M. O. Malte, botanist of the National Museum; a ship's doctor; and a secretary to the Officer in Charge. The ship's crew will number thirty-three, officers and men. Captain E. Falk will be the Master and Captain L. D. Morin, pilot. It is expected that the voyage will occupy sixty days and on the return trip, besides the police officers coming out on leave, Dr. L. J. Weeks and Mr. M. Haycock, of the Geological Survey, and Dr. L. D. Livingstone, all of whom spent the winter at Pangnirtung, will accompany the expedition to the home port.

The newsprint paper made in Canada during the year 1925, if spread out in a single sheet, would cover an expanse of approximately 10,000 square miles, which is about the area of lake Erie.

NATURAL RESOURCES CANADA

Published by DEPARTMENT OF THE INTERIOR, Ottawa

VOL. 6 JUNE, 1927 NO. 6

EXTENSIVE AERIAL WORK IS PLANNED FOR 1927 SEASON

ROYAL CANADIAN AIR FORCE PROGRAM

Civil Operations For Other Government Departments Includes Variety of Work—Important Surveys

Each year aviation is playing a greater part in the development and conservation of the natural resources of the Dominion. Aerial transportation is solving the most urgent problems of the forester, surveyor, geologist, and explorer in their work in the more remote and unexplored parts of the country as well as in the settled districts, and new applications of aerial methods to other lines of research are constantly enlarging the field of usefulness of the aeroplane.

Civil aviation in Canada is only seven years old, but already it has a part in the regular activities of many of the departments of the Government and is of primary importance in forestry and mapping and their allied activities.

The 1927 program of the Royal Canadian Air Force in civil operations for government departments includes the following work:—

DEPARTMENT OF THE INTERIOR

Forest Service.—In southwestern Alberta the Rocky Mountains forest reserve from near the International Boundary to the Saskatchewan river is protected by aircraft fire detection patrols. In Manitoba and Saskatchewan the aeroplane serves both in the detection and suppression of fires over the forested areas to the east and north of lake Winnipeg and westerly across northern Saskatchewan to the Alberta boundary.

Topographical Survey.—Vertical aerial photography in connection with mapping the Rouyn mineral area and in the Gatineau, Batiscan, and Ste. Anne de Beaupre districts in Quebec. Vertical photography in western Nova Scotia and in the Muskoka, Sudbury, and Temiskaming districts of Ontario. Oblique aerial photography for mapping the Quetico, Lake of the Woods, and Lake Nipigon districts in Ontario. In Manitoba vertical photography in the Riding Mountain district and oblique photography east and west of lake Winnipeg. In Saskatchewan vertical photography in the Prince Albert district and oblique photography in the Lac la Ronde and Lac Mironde areas. Vertical photography in the vicinity of Red Deer, Alberta, and on Vancouver

(Continued on page 4)

DEVELOPMENT OF MOTORING IN CANADA

Good Road Systems Greatly Extended—Growing Numbers of Touring Motorists Throng Our Highways

The advent of the summer season and the universal appeal of motoring are again directing the attention of thousands of people in all walks of life to the possibilities that lie immediately ahead for enjoyment in the freedom of our open spaces. Maps are once more in demand; routes and programs are laid out with a joyous anticipation, which, in its reaction on the individual is almost as productive of good health and spirits as the trip itself.

Development of Motoring in Canada—A bridge approach with a remarkable scenic setting on one of the main motor highways in the province of Ontario.

When one stays to consider that it is but 43 years since the successful construction of the gasolene engine made the present motor car possible, and further that it is only since the year 1900 that the automobile has become in any sense part of the life of America, the rapid development of this means of conveyance is brought vividly to mind.

The number of passenger cars registered in the Dominion in the year 1926 was 728,905. This represented an increase of 14 per cent over the figures for 1925. But this is not the whole story: Canada is rapidly assuming a prominent position as a resort for motorists from the United States. It is estimated by the Department of Customs that no fewer than 2,076,255 cars were admitted to the Dominion for periods up to six months. Of this number 1,521,181 visiting cars stayed 24 hours or less; 550,906 made a stay not exceeding one month; and 4,168 remained from one to six months. Compared with 1925 there is a pronounced increase in the number of visiting cars staying for periods of time in excess of one day; for periods over one day but not exceeding one month the number increased from 481,161 in 1925 to 550,906 in 1926 or by 14 per cent; and for periods of from one to six months the number rose from 2,948 to 4,168, showing an increase of 41 per cent. The long period figures are most interesting from the angle of what this foreign tourist traffic means to Canada in a financial way. The general basis for arriving at an estimate of this is to assume that an outlay of $5 per head is made for supplies and exportable purchases; that each car carried four persons; and that each touring party stayed in Canada approximately the full time in the case of the one-day permit, and half the time in the case of a permit

(Continued on page 3)

**Prepared under the direction of the Chief Commissioner, Canada Highways Commission, Ottawa.*

NEW NATIONAL PARK SET ASIDE IN SASKATCHEWAN

HAS AN AREA OF 1,300 SQUARE MILES

Scenic Beauty and Recreational Possibilities of Prince Albert Park Outstanding Features

One thousand three hundred and seventy-seven square miles, comprising a portion of the primitive forest and lake country of northern Saskatchewan, has been set aside as a great scenic playground under the name of Prince Albert National Park. The creation of this new park which was announced by the Minister of the Interior recently is in continuation of the policy of the Dominion Government to preserve areas of outstanding natural beauty as national recreational reserves and wild life sanctuaries for the benefit, use, and enjoyment of the people of Canada.

The selection of this area in Saskatchewan will fill a want long felt by the people of this Prairie Province. Saskatchewan had, heretofore, no national park of any magnitude within her boundaries and this reservation will give her citizens and those from adjoining areas an opportunity to enjoy the pleasures and reap the benefits of holidaying in the "great open spaces" amid most picturesque surroundings.

The land set aside is largely covered with green timber and contains many beautiful lakes with sandy beaches. The lakes and streams teem with game fish—pike, pickerel, and trout—and along the reedy shores flock ducks, geese, and many other wild fowl. The wooded areas constitute excellent breeding grounds for the many forms of both small and big game for which this part of the Dominion is noted. Added to these attractions is the outstanding natural beauty of the region, combining to make the new park eminently suitable for national recreational purposes.

Prince Albert park is situated almost directly north of the city of Prince Albert and may be reached by road from that point, the distance to the southern boundary of the park being approximately thirty miles. Big River and Dumble, also on the Canadian National railway, are points to the west from which the new park may be entered. At present the road from Prince Albert traverses the park to Montreal lake. An interesting feature of the new park is that it will constitute a gateway to the great northern hinterland as

(Continued on page 3)

TO TAX FURS TAKEN IN NORTHWEST TERRITORIES

Will Conserve Fur-bearers of Northern Canada and End Certain Fraudulent Practices

Fur-bearing animals form no inconsiderable portion of Canada's natural wealth and the conserving of this resource is a matter of constantly growing importance. In each of the provinces excepting Prince Edward Island, where the fur-bearers are chiefly foxes raised in captivity, a tax on furs has been in force for some years. Yukon territory has also had a tax on furs exported; at the 1927 session of Parliament an amendment was made to the Northwest Territories Act establishing a tax in that territory, which is to come into operation January 1, 1929. In explaining the bill upon its introduction, Hon. Charles Stewart, Minister of the Interior, after referring to the existence of similar taxes in other provinces and the need for revenue to meet the outlays for territorial administration, noted that the authorities in some of the western provinces had urged upon the Dominion Government the advisability of imposing a fur tax in the Northwest Territories. Their ground was that the Prairie Provinces were losing revenue every year because many furs taken in the northern parts of these provinces were passed off as having been taken in the Northwest Territories and, therefore, not subject to tax. The tax to be imposed by the recent amendment will make the dues per pelt in the Northwest Territories the same as in the three Prairie Provinces and British Columbia, so that defrauding of the provincial revenues by this method will no longer be possible after the coming into effect of the amendment.

Conservation of fur-bearers will be promoted by the new law in several ways, and the interests of the natives are further looked after, in that, since the tax is levied only on furs exported it does not affect the furs which are used for clothing. Permits will be required to ship out furs and in order to prevent the smuggling of valuable small pelts in shipments of non-taxable furs such as wolf skins, all pelts will be examined and stamped. This it is believed will check the pernicious practice of taking unprime furs, that is, furs of animals killed when not in prime winter condition. Furthermore, this examination will show the actual take of furs both by species and by districts, and provide data which will be of the utmost value from a conservation standpoint.

The following is a schedule of the dues per pelt to be collected under the Act in the cases of the different furs. The species named in the schedule are the same as those taxed in the Prairie Provinces and in British Columbia, except that polar bear is added and raccoon omitted:—

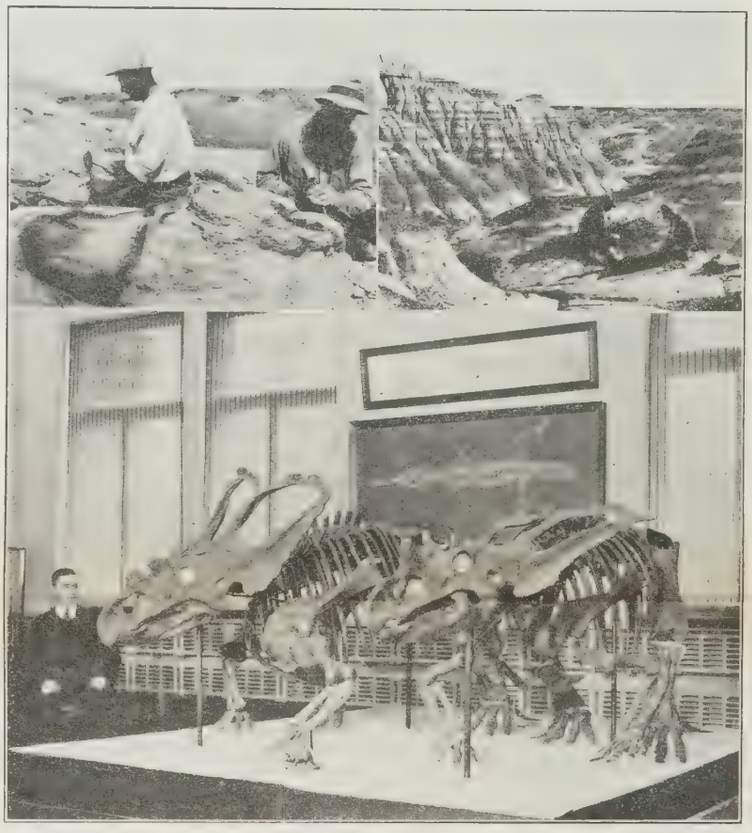
Bear, White or Polar	$2.00
Bear, not specified	40
Beaver	1.00
Fisher	1.50
Fox, Black	5.00
Fox, Blue	2.50
Fox, Cross	1.50
Fox, Red	75
Fox, Silver	5.00
Fox, White	1.50
Lynx	75
Marten	1.00
Mink	25
Muskrat (Musquash)	05
Otter	1.00
Skunk	10
Weasel (Ermine)	03

CANADA'S DINOSAUR COLLECTION*

Fine Exhibits in National Museum Result From Work in Red Deer River Field

Nearly every spring since 1912, the Geological Survey of the Department of Mines has sent a collecting party into the Red Deer River dinosaur field in Alberta. Each succeeding fall great massive skulls and other bones, carefully packed, have been brought out. In the early days of this work the transportation of these specimens often had to be done by the collectors themselves but latterly the construction of roads and the use of motor cars have helped solve the problem of getting the "finds" out to the railway for shipment to Ottawa. The results of this persistent collecting in one of the richest dinosaur fields in the world are being placed, as fast as the specimens can be mounted and prepared, on exhibition in Canada's National Museum. The collection of dinosaurs on exhibition at Ottawa is one of the finest in the world. An eminent palaeontologist who recently visited the National Museum was greatly impressed by the Canadian collection and classed it second only to that in the American Museum of Natural History in New York. Both the National Museum in Ottawa and the University of Toronto Museum have unique specimens, and anyone wishing to get a comprehensive idea of the Cretaceous dinosaurs of Canada should see both of these fine exhibits.

The Red River dinosaur field in Alberta first became known in the eighties Dr. G. M. Dawson, a former director of the Geological Survey of Canada, in 1888 sent into the Red Deer valley an expedition which brought out the skull and other bones of a dinosaur. These initial discoveries represent the nucleus of the present fine collection. The late Lawrence Lambe, who was for several years vertebrate palaeontologist of the Geological Survey of Canada, made collections in the Red Deer field at a later date and described many new species from this region. In 1912 the employment by the Geological Survey of four skilled collectors, C. H. Sternberg and his three sons, began a new era in the development of the rich deposits of the Alberta vertebrate fossil field, and since that time the collecting and mounting have been continued with only few interruptions.



Canada's Dinosaur Collection—A fine pair of dinosaurs from the Red Deer River field which were recently added to the exhibits in the National Museum at Ottawa. Inset—(Left) Extracting a dinosaur specimen. (Right) A view of a portion of the Red Deer River field.

The greatest care must be exercised in the entire operation of securing specimens of dinosaurs. An outcrop exposing a part of the fossilled bone or a fragment of bone usually leads to the discovery of the deposit and then by careful chiselling the upper parts of the bone or bones are freed from the rock. A covering of plaster of paris is applied to protect the specimens and the work of freeing the underpart is then begun. Plaster of paris is also applied to the bottom parts and the whole is then wrapped in a coating of sacking and more plaster until it makes a compact bundle. When these have been moved to the base of operations, either by man-packing, horse, or motor car, they are crated and later shipped by scow down the Red Deer river to the railway. At the museum in Ottawa, the packing is carefully removed and the fossils are cleaned and where possible missing fragments are restored. The majority of the specimens are mounted for the National Museum exhibits, a certain number are set aside for exchange purposes with other museums, and the remainder are stored for future exhibition purposes.

Dinosaur vertebra have been found in other parts of Canada, some as far north as Bathurst island off the Arctic coast and future discoveries may yet disclose in the little-known northland some new dinosaur field which will contribute as much as the Red Deer valley has done to our knowledge of Canada's strange reptilian life in Cretaceous times.

**Prepared under the direction of Dr. Charles Camsell, Deputy Minister of Mines, by Dr. E. M. Kindle, Geological Survey of Canada.*

GOOD TURF GRASS SEED GROWN IN MARITIMES*

Browntop Seed Produced in Prince Edward Island and Nova Scotia of Fine Quality

With the large increase in the number of golf courses during recent years a demand has arisen for a supply of the better varieties of turf grass seeds. The German Mixed Bent industry had declined during the war, and the Browntop or Colonial Bent seed from New Zealand was frequently very chaffy, low in vitality, and badly polluted with weed seeds. Dr. M. O. Malte, Chief Botanist of the National Herbarium, Ottawa, had collected Browntop plants in Prince Edward Island, and several fields of excellent quality were located in 1924.

The Dominion Seed Branch of the Department of Agriculture undertook the development of seed production of the Browntop and a fairly large supply is now available from the 1926 crop for seeding on golf courses, bowling greens, tennis courts, and fine lawns. Given fair treatment under turf conditions, Browntop, harvested from fields in Prince Edward Island and northern Nova Scotia, should prove entirely winter hardy. Some of the fields from which Browntop seed is being harvested are over ten years old and the grass has flourished through climatic conditions which frequently kill out red clover and are always too severe for winter wheat. The Browntop grows naturally, renews itself when the meadows are broken, and withstands the cold winds of winter, ice formations, and freezing and thawing of early spring.

The Browntop seed is subjected to a thorough cleaning process for the elimination of bad turf seeds and it is estimated that 60 per cent of the 1926 crop will grade No. 1 under the Seeds Act. Seed of this grade will reduce the handweeding of turf to a minimum and is recommended particularly for putting greens. Certified Browntop is cleaned to about 90 per cent pure seed and the average germination is 85 per cent, which is a very high standard for fine Bent grass when it is remembered that there are about 6,000,000 seeds to the pound.

**Prepared under the direction of Dr. J. H. Grisdale, Deputy Minister of Agriculture, Canada, by Mr. G. LeLacheur, Assistant to the Seed Commissioner, Ottawa.*

NATURAL RESOURCES CANADA

PUBLISHED BY

THE DEPARTMENT OF THE INTERIOR

HON. CHARLES STEWART,
Minister

W. W. CORY, C.M.G.,
Deputy Minister

Natural Resources, Canada, is published monthly for the purpose of promoting interest and supplying information respecting Canada's natural resources and their development. Applications to receive this publication and inquiries respecting any matter or document dealt with should be addressed to

The Secretary,
Department of the Interior,
Ottawa.

Natural Resources, Canada, is published in French as well as in English.

OTTAWA, JUNE, 1927

THE 60th ANNIVERSARY OF CONFEDERATION

The appropriate phrasing of the resolution passed unanimously in the Dominion House of Commons and the Senate on the closing day of the first session of the Sixteenth Parliament (April 14, 1927) cannot fail to make a strong appeal to all Canadians.

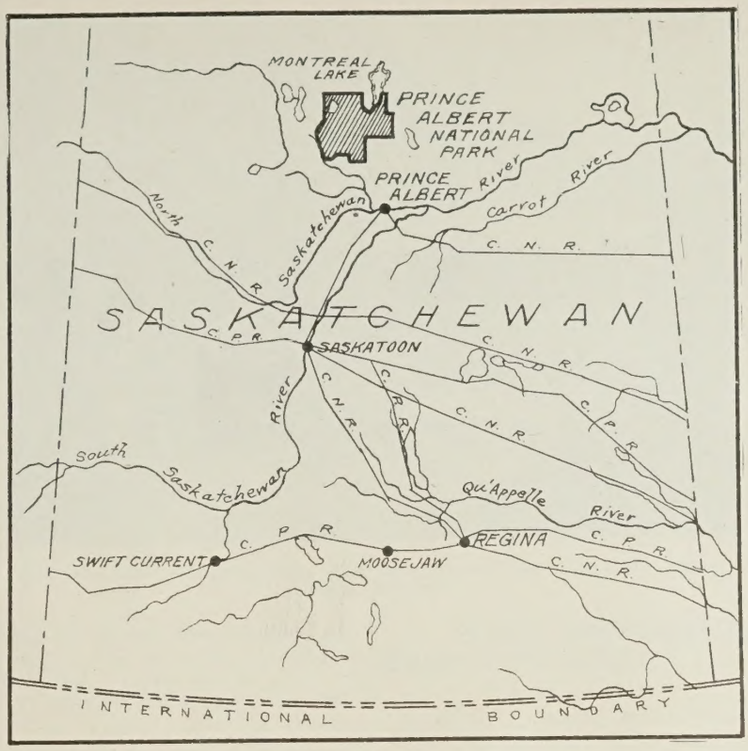
The Diamond Jubilee of Confederation should be a means of directing attention to the great traditions and heritage committed to the charge of those now living. In recalling the labours of those who, in the past, toiled for the common good, it ought to provide inspiration and guidance for the future, and serve to remind all that the way of national strength lies in unity, in a broad tolerance, and in a sympathetic understanding of our problems.

Citizens young and old, rich and poor alike, are urged to read carefully the resolution which is here reproduced:—

"Resolved, that as Canada is approaching the sixtieth anniversary of her founding as a Dominion, the Parliament of Canada place on record its deep appreciation of the achievements of the Fathers of Confederation, and with united voice express its faith and confidence in the future of this our country, and its development as a member of the British Commonwealth of Nations, owing allegiance to His Majesty the King.

"It is the earnest wish of Parliament that the Diamond Jubilee Celebration for which plans are now being rapidly matured shall commemorate appropriately and enthusiastically the accomplishment of Confederation and the subsequent progress of the Dominion. We trust that this commemoration will lend added inspiration to the patriotic fervour of our people, and afford a clearer vision of our aspirations and ideals, to the end that from sea to sea there may be developed a robust Canadian spirit, and in all things Canadian profounder national unity."

Twin lakes, near Canmore, Alberta, have been renamed Grassi lakes after Lawrence Grassi, well-known mountain climber and guide.



Prince Albert National Park, Saskatchewan—Map of the southern part of the province showing the location of the new park and its proximity to Saskatchewan's principal centres of population.

NEW NATIONAL PARK SET ASIDE IN SASKATCHEWAN

(Continued from page 1)

its river and lake system is connected up with great waterways lying to the north and to the east. As a matter of fact it will be possible for a person to make a canoe trip, with comparatively few portages, from the park to Hudson bay.

The administration of the new park will be carried on by the Department of the Interior through the Canadian National Parks Branch. A comprehensive fire and game protective service is being organized under the recently appointed Park Superintendent, Mr. J. A. Wood, B.Sc. During the summer, surveys will be carried on to locate a main trunk highway through the park and in addition the entire area will be carefully investigated so that in its development every opportunity will be provided for the enjoyment of the great scenic beauty and natural recreational possibilities. The construction of highways, the standardizing of existing roads, and the provision of other improvements to meet the demands of the Dominion's ever-increasing motor traffic will hold an important place in the program of development being formulated.

DEVELOPMENT OF MOTORING IN CANADA

(Continued from page 1)

for a longer period. On this assumption the tourists from outside Canada left in the Dominion estimated gross outlays of $203,197,820 during 1926. The following table shows the distribution between the different provinces, both as regards number of entries and estimated gross outlay:—

Province	Number of Entries	Estimated Gross Outlay
Alberta	9,608	$ 1,032,520
British Columbia	140,726	29,366,500
Manitoba	34,969	3,441,120
New Brunswick	65,433	5,607,180
Nova Scotia	809	499,200
Ontario	1,554,638	108,524,040
Prince Edward Island	27	38,100
Quebec	261,777	51,837,980
Saskatchewan	8,268	2,851,180
Totals	2,076,255	$203,197,820

The real inducement to an extensive motor traffic is a good system of roads—trunk highways connecting the important cities, with auxiliary systems spreading out over the entire country. Motor highway construction and general roadway improvement are proceeding apace in Canada. The total road mileage is now estimated at 426,269. Included in this estimate are 47,177 miles of gravel highway, and about 7,500 miles of macadam and concrete construction. Each year witnesses a substantial addition to the total and, in 1926, 5,788 miles were added, distributed as follows:—

Province	Miles
Alberta	652
British Columbia	303
Manitoba	666
New Brunswick	1,004
Nova Scotia	252
Ontario	1,682
Prince Edward Island	31
Quebec	718
Saskatchewan	480
Total	5,788

In 1919 the Dominion Parliament authorized the expenditure of $20,000,000 for constructing and improving highways in Canada. Under the agreements then entered into the Federal authorities undertook to provide 40 per cent of the cost of approved projects; the provincial governments concerned were to provide the remainder, and to see that roads were maintained to the standard of construction approved. To date 7,300 miles of trunk highways have been constructed under this arrangement and to the end of March, 1927, $18,775,604 had been paid out of the Dominion fund.

During 1926 a total of well over $45,000,000 was spent on construction and maintenance, etc., on public highways in Canada. Of this nearly $16,000,000 was allocated to maintenance of highways already constructed.

CANADIAN TREE SEEDS FOR BRITISH PLANTING

Large Part of Seeds Obtained by Forest Service Extraction Plants Go Overseas

Not only do "great oaks from little acorns grow," but trees as large as any oak that grows may originate in a seed which weighs only the one-thousandth part of the weight of an acorn The Sitka spruce, a tree of Canada's western sea-coast, attains a height of 160 to 180 feet and a diameter of 8 to 12 feet; but the seed from which it springs is so small that it takes 300,000 of them, or even more, to weigh a pound. Seed of the western cedar, so well known as the source of shingles, has about the same weight. The seed of the Douglas fir, the largest tree in Canadian forests, weighs about one forty-thousandth of a pound.

The white pine, once the standby of the eastern lumberman, and still the choicest wood in the eastern forest, commences as a little seed weighing about 26,000 to the pound, and may grow to a height of 100 to 150 feet and a diameter of 30 to 40 inches. The white spruce, the tree used in greatest quantity by eastern lumbermen and pulp manufacturers, starts life as a seed which takes 120,000 to make up a pound weight.

In order to give an idea of what this means, comparison may be made with some more familiar vegetable and weed seeds. The seed of the Sitka spruce or western cedar would weigh about as much as two dandelion seeds, about the same as a single seed of the carrot, chickory, or black mustard, and less than a single seed of garden cress or onion.

For several years the Forest Service of the Department of the Interior has carried on the work of collecting tree seeds of western species—a work begun largely at the suggestion of the British authorities who are undertaking reforestation of lands in England and Scotland. Besides a large seed-extraction plant at Vancouver, British Columbia, at which large quantities of seed collected from forests in all parts of British Columbia are extracted, three smaller ones are maintained in the Prairie Provinces (at Rocky Mountain House, Alberta, and at Indian Head and Prince Albert, Saskatchewan) to supply seed for experimental and reforestation work in the forest reserves and elsewhere.

In the year 1926 about 11,000 pounds (five and a half tons) of seed was obtained from these different establishments. Of this quantity about 1,500 pounds was Sitka spruce seed. A little arithmetic will show the possible number of trees that may spring from this quantity of seed. Over three tons (more precisely, 6,400 pounds) of western yellow pine seed, 1,700 pounds of Douglas fir seed, 500 pounds of western cedar seed, about the same quantity of white spruce seed, and 151 pounds of jack pine seed were also produced. Much of this seed is destined for use in reforestation work in the British Isles. New Zealand also has taken a large quantity of the seed of Canadian trees for her reforestation work.

BEET SUGAR INDUSTRY IN SOUTHERN ALBERTA

Department of the Interior Investigates Soil and Moisture Requirements of This Crop

The sugar beet industry, in so far as production is concerned, is in its infancy in Canada. Of the 415,000 tons of sugar consumed in this country in 1924, only 10 per cent was Canadian beet sugar.

Although beet growing was introduced in Alberta in 1903, first operations did not prove altogether successful owing to competition in the sugar market and the inability to secure sufficient acreage tributary to the factory. It was not until 1924 that the erection of a modern refining plant in the heart of the irrigated areas of southern Alberta again revived the young industry. This factory, with a grinding capacity of 1,000 tons of beets per day, can utilize the crop from about 11,000 acres.

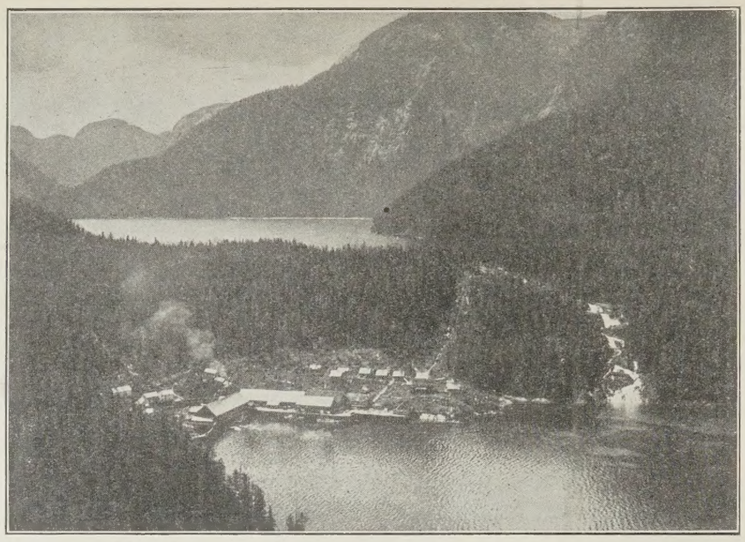
In 1925 some 5,400 acres were seeded to beets, producing 41,500 tons from which 3,500 tons of sugar were manufactured. The following year, while the acreage and tonnage were slightly less the sugar content of the beets was higher and 4,800 tons of sugar was produced. The price paid the grower in 1925 was $5.75 per ton; in 1926, $6.25 per ton; and for the coming season $7 per ton has been guaranteed. This steady increase in price, which is most incouraging to the growers, is attributable in a large degree to the consistent increase in the sugar content of the beets grown, but is partly due to the general advance in the price of sugar. The sugar content of the 1926 crop reached the satisfactory average of 16.43 per cent.

From data collected during the short period of operation in Alberta it is estimated that the cost of producing an acre of beets is approximately $60. An average yield of sugar beets is about 10 tons per acre but with proper cultivation, a fertile soil and efficient irrigation this can be considerably exceeded, more than 20 tons per acre having been grown under favourable conditions.

The beet is a heavy soil feeder. A 15-ton crop removes from the soil more mineral plant food than a 60-bushel crop of corn, a 50-bushel crop of wheat or a 300-bushel crop of potatoes. It is, therefore, essential that such crop rotation and cultural methods be adopted as will maintain an adequate food supply. At the same time this crop requires a moist soil at all times, but particularly during July and August when the plants' requirements are greatest. From 18 to 20 inches of water during the growing season is required to produce the highest yields and such an amount in southern Alberta can usually be obtained only when the natural precipitation is augmented by judicious irrigation.

The by-products of the industry are pulp, which when dried is much sought after as fodder for cattle; filter cake which is a potential fertilizer; and molasses which can be used for the production of industrial alcohol, cattle food, fertilizer, etc. In Europe an important branch of industrial chemistry has been built up around the industry, but in Alberta the tendency is to link up beet growing with stock raising.

The Dominion Water Power and Reclamation Service of the Department of the Interior has for several years conducted extensive research work at their "Duty of Water" experimental station at Brooks with a view to obtaining definite data regarding the particular soil and moisture requirements of this crop. The demand for the results of these investigations is evidence of the great interest being taken by farmers in successful beet cultivation on varying soil types under irrigation.



Aviation in Canada—An aerial view along the Pacific coast showing one of Brtish Columbia's many fish canneries.

EXTENSIVE AERIAL WORK IS PLANNED FOR 1927 SEASON

(Continued from page 1)

island, British Columbia. Oblique photographs of the Wood Buffalo park in the Northwest Territories.

Canadian National Parks.—Fire detection patrols in the Waterton Lakes park and Rocky Mountains park. Pictorial views of sites of historic interest when circumstances permit.

Dominion Water Power and Reclamation Service.—Vertical and oblique photographs in connection with the development of power projects in Ontario and Quebec. Vertical photography of Rainy lake, Ontario, and the Nelson and Churchill rivers in Manitoba and Saskatchewan.

International Boundary Commission.—Vertical and oblique photography over the International Boundary from lake of the Woods to Emerson, Manitoba.

OTHER DEPARTMENTS

Department of Indian Affairs.—Transportation of Treaty-paying parties in northern Manitoba.

Department of National Revenue.—Transportation of officers of the Preventive Service as necessary.

Department of Marine and Fisheries.—Aerial patrol of Hudson straits to determine ice conditions in connection with navigation of Hudson bay. Patrols for the prevention of illegal fishing on the Pacific coast.

Department of Agriculture.—Experimental dusting for the prevention of wheat rust in the Prairie Provinces and for the control of the Spruce Bud worm in Cape Breton island.

Department of Mines.—(In co-operation with the Topographical Survey.) Vertical photographs in mineralized areas in Ontario and Quebec.

Department of Public Works.—Vertical and oblique photography of harbours and harbour works.

Department of Railways and Canals.—Vertical photography of Welland canal.

In addition to the work of the Royal Canadian Air Force extensive programs are being carried out by provincial governments and private interests. The province of Ontario operates its own flying service and during the period of fire hazard, fire detection and suppression patrols are carried on throughout northern Ontario. Forest type mapping is also carried out on a large scale, as well as exploration in the district of Patricia and the transportation of survey parties and government officials.

In Quebec the work is undertaken by commercial companies, under contract, for the provincial government. Extensive programs of vertical photography for forest mapping are being undertaken in the Lake St. John and Gaspe districts and much transportation for survey parties on the north shore of the gulf of St. Lawrence is done by aircraft.

Commercial services are operating air lines in the mining districts of Rouyn, Quebec, and of Red Lake in western Ontario, and the aeroplane has made possible the intensive prospecting of these regions in the last two or three years. Supplies and equipment for the survey of Churchill harbour were transported, under contract, to Churchill this spring by a commercial company at a great saving of time and money.

A PIONEER JOURNEY ACROSS THE ROCKIES

In accordance with the policy of incorporating the history of the Dominion in its place-names, the Geographic Board of Canada has named a mountain in latitude 54° 08′ longitude 120° 10′ after Major C. F. Hanington, of Ottawa, who with Mr. E. W. Jarvis, C.E., made an adventurous winter journey across the Rockies in 1875. The pass through which they crossed the mountains has already been named Jarvis pass by the Board and the name Jarvis is also borne by a mountain on the south side of the pass opposite mount Hanington. The exploration was undertaken to see if this route across the mountains would be a practicable one for the Canadian Pacific railway. The elevation of the pass, about 5,000 feet, proved too high. The starting point of the journey was Quesnel, British Columbia, which was left on December 9, 1874, and a 1,000-mile journey, mostly on foot, occupying five and a half months was concluded at Winnipeg on May 21, 1875.

FRANKLIN EXPEDITION RELICS IDENTIFIED

Articles Collected on Canada's Artic Coast Examined by British and Canadian Authorities

Examination of various articles collected along the Arctic coast of Canada during 1925 and 1926, by officers of the North West Territories and Yukon Branch of the Department of the Interior, has been completed and the belief that they are relics of the ill-fated Franklin expedition has been confirmed.

Four pieces of blue serge, two pieces of leather, two wooden bowls, a circular metal plate, a small piece of oak, a knife with stone blade and walnut handle, and a piece of hoop iron, one edge partly notched to form a saw, were sent to the British Admiralty in London. The examination of these relics and a comparison with material issued to Her Majesty's ships at the time of the Franklin expedition showed that in the cases of the serge, the leather, and the hoop iron, they can be regarded with little doubt as having been left by that expedition. Regarding the pieces of cloth, the Admiralty experts report: "These pieces, found at Starvation cove, are exactly similar, in texture and in the striation caused by weathering, to the specimens of naval cloth from the *Erebus* and *Terror* found by McClintock. There appears to be little doubt that they are relics of the Franklin expedition." As to the remaining articles the connection is not so definite.

A human skull picked up by a trader at Thunder cove, Adelaide peninsula, ten miles across the Simpson straits from King William island, was examined by the Dominion Department of Health at Ottawa and the conclusion arrived at is that it is the skull of a young man of modern European type and presumably that of an Englishman. This conclusion is concurred in by the ethnologists of the Geological Survey of the Department of Mines who were also consulted. Inasmuch as the Franklin ships were abandoned near the northernmost point of King William island and the whole party died from exposure and starvation, there is every probability that the skull was that of one of the last survivors of that expedition. The spot in which the skull was found is one over which the party would have to pass in their effort to reach Back river, which was their objective.

The articles examined by the British Admiralty have been presented to the Naval Museum at Greenwich where they will be placed on exhibition with other relics of the Franklin expedition. The skull has been deposited in the museum of the North West Territories and Yukon Branch of the Department of the Interior at Ottawa.

The value of bird protection as a money-earning enterprise has again been shown at Percé, Quebec. Percé rock and Bonaventure island, where sea birds nest in thousands, have long been bird sanctuaries under Provincial and Dominion law. Last winter an addition of twenty-seven rooms was made to a local hotel to accommodate the growing number of nature lovers who come each summer to this mecca of the sea-fowl, and an increase was also made in the number of houses where tourists can be accommodated.